THE IRON AGE

THURSDAY, OCTOBER 25, 1888.

A New Oil Cup.

Messrs. Pedrick & Ayer, 1025 Hamilton street, Philadelphia, Pa., are bringing out the new form of oil cup shown on this page. The engravings give a good idea of the appearance and construction of the device. Fig. 1 is a rod oiler, the top of which screws on, or can be made to slip on and be held by a spring catch. Fig. 2 is a guide oiler, the cover of which has a small vent hole in the top to admit the air to facilitate feeding the oil, and also to allow it to be taken off readily. Fig. 3 is a section view of the rod cup, showing the internal arrangement. This is the same in all the cups. The bracket-shaped piece in the interior of the cup is split open. It is wedged apart at the time that the screw is cut, so that it always, even after long use, clamps the spindle and holds it in any desired position, without the aid of jam-nuts or binding screws. Around the upper edge of the cup are marks by which the engineer can adjust the opening to feed the required amount, according to the temperature of the weather and the quality of oil used. When the engine is out of use, it is only necessary to screw down the spindle and the flow of oil entirely stops. The oilers are made in two sizes. A cup, similar to the guide cup, for locomotive truck brasses is made. These oil cups are in very extensive use by the Northern Pacific and the Philadelphia and Reading R. R. Companies, and are claimed to be superior to any other cup ever used. The spindle is easily manipulated and remains in any desired position; no extra tools are needed for adjustment, and they can be easily cleaned out, there being plenty of room for that purpose.

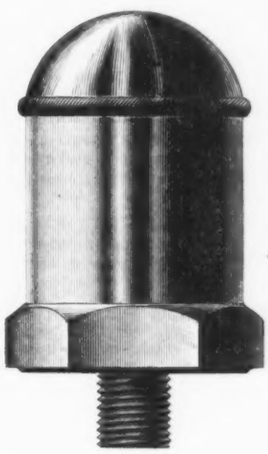


Fig. 1.—Rod Oiler.

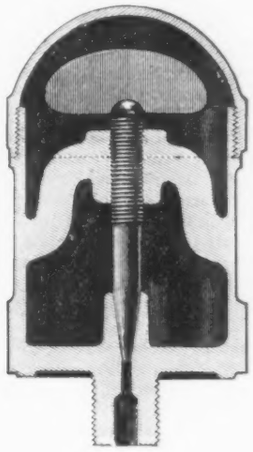


Fig. 3.—Section of Rod Oiler.

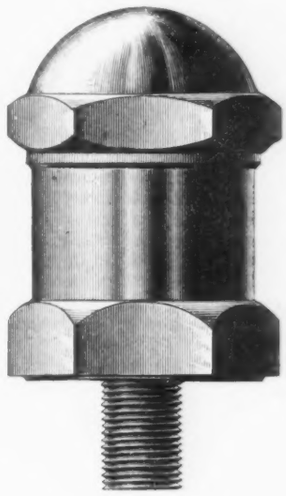


Fig. 2.—Guide Oiler.

NEW OIL CUP, MADE BY MESSRS. PEDRICK & AYER, PHILADELPHIA, PA.

The Philadelphia and Reading Coal and Iron Company have commenced to make use of the sinking fund to cancel the mortgages on its lands. Some time ago the Board of Management directed that 10 cents per ton on all coal mined for the lands owned by the company should be set aside as a sinking fund to be used either in the acquisition of additional lands or in liquidating coal land bonds and mortgages. When some of these bonds were purchased mortgages were allowed to remain. On the 1st of next month the company will pay off and cancel a divisional mortgage on the Raudenbush tract. The amount is $110,000, and the property covers 1100 acres.

Flow of Steam in a Tube.

Through an oversight, a more extended reference to Mr. C. H. Peabody's paper on "Flow of Steam Through a Tube," presented last week before the American Society of Mechanical Engineers, was omitted from our last issue.

The paper was a record of some experiments on the flow of steam made in the mechanical engineering laboratory of the Massachusetts Institute of Technology. The tube used in these experiments was of brass 0.275 inch internal diameter and 8 inches long. At the entrance end a plate, 1½ inches in diameter, was driven on flush with the end of the tube, and the orifice was well rounded to avoid contraction. This tube led from an iron pipe 6 inches in diameter and 2 feet long. The brass tube discharged into another iron pipe 6 inches in diameter and 2 feet long, which formed a chamber in which the steam came to rest, and from which it was led to a surface condenser. The two pieces of 6-inch pipe were capped on the outer ends, and had flanges on the inner ends, between which was a plate holding the experimental tube. The whole apparatus was lagged on the outside, and the plate holding the brass tube was covered on both sides with about 4 inches of asbestos to prevent the flow of heat from one part of the apparatus to the other.

Steam was led to the apparatus by a lagged pipe 1 inch in diameter and away from it to the condenser by a pipe of the same size. Each of these pipes had a valve near the apparatus. The valve in the supply-pipe was used merely to shut off the steam when the apparatus was not in use, and, during an experiment, it was wide open, so that the pressure in the first 6-inch tube was full boiler pressure or nearly so. The valve in the exhaust-pipe was manipulated to maintain the desired difference of pressure between the two parts of the apparatus. Each chamber of the apparatus was supplied with a good steam gauge and with a thermometer in a long brass cup filled with oil. The gauges were compared with a mercury column and the thermometers were calibrated and their freezing and boiling points were determined. The exhaust steam was condensed in a small surface condenser and weighed in a tank.

The experiments were begun after the apparatus had been running steadily for some time and lasted about half an hour. Steam for the experiments was drawn from the main steam-pipe, and, as the supply-pipe had a drip near the apparatus, which remained open during an experiment, it was assumed that the quality of the steam was the same as that in the main pipe. A large number of experiments with different types of calorimeters gave 1½ to 2 per cent. of moisture in the steam. Later experiments with a new type of calorimeter, described in a paper presented to this meeting, gave under normal conditions 1 to 1.5 per cent. of moisture. With a large difference of pressure the steam, after coming to rest in the chamber beyond the tube, was superheated, and, by the method employed with the new calorimeter, the amount of moist ure could be calculated, giving the same result.

As the more recent data were not available till the work was nearly complete, the moisture was assumed to be 2 per cent. in all the calculations. The error from this source is inconsiderable. The data and results of the experiments are given in the following table:

	Pressure of steam in front of tube.	Pressure of steam beyond tube.	Difference of pressures.	Flow of steam per hour by tank in pounds. Gt	Flow of steam per hour, calculated in pounds. Ge	$\frac{Gt}{Ge}$
1.....	69.1	4.4	64.7	229.0	182.3	1.260
2.....	69.6	9.7	59.9	230.4	211.2	1.091
3.....	71.3	14.8	56.6	242.0	233.4	1.037
4.....	69.1	19.4	49.7	232	242.2	0.958
5.....	70.0	24.5	46.5	234.5	256.6	0.914
6.....	70.3	29.1	41.2	229.0	261.5	0.876
7.....	72.00	34.2	37.8	232.0	268.9	0.860
8.....	72.00	39.5	32.5	221.4	266.9	0.830
9.....	71.6	44.2	27.4	216.5	260.1	0.833

The table will be readily understood from the headings. The ratio of the actual

quantity to the calculated quantity, if the theory were entirely applicable to this case, should resemble the coefficient of flow for water through a short pipe, and should not be greater than unity. The marked, though regular increase of this ratio with the increase of the difference of pressure, and the fact that, for the larger differences, this ratio is larger than one, shows conclusively that some of the assumptions are inadmissible. It is not improbable that heat is given by the steam to the tube at the admission end, and regained by the steam toward the exit end. Such an interchange must influence both the condition of the steam at the orifice and the rate of flow. The well-known phenomena of cylinder condensation and re-evaporation in steam-engines show that such an action may be energetic. It is also possible that the length of the tube is not sufficient to insure a steady flow. It is noticeable that the weight of steam discharged by the tube has a maximum, which is for a difference of pressure of about 35 pounds by theory, and for a difference of pressure of about 55 pounds by experiment. All the work of experiment and calculation was done by Mr. G. Buttolph.

Specifications for Steel Rails.

In our report of the meeting of the American Institute of Mining Engineers, at Buffalo, we referred briefly to a paper read by R. W. Hunt, of Chicago, Ill., on "Steel Rails and Specifications for Steel Rails." Passing over that part of it which deals with the history of their manufacture and with the question of the form of modern heavy sections, we may quote those parts of the paper which are explanatory of the provisions of the specifications.

We will assume the section selected to be the best possible; it now remains for the maker to furnish a good rail rolled to it. The character of the permanent way of the railroads of the United States is improving each year. Consequently the demand that the mills shall deliver their rails well finished and straight in all directions is much more imperative than in the past. Of course, absolute accuracy in so gross a product is both unnecessary and impossible, but practical accuracy is attainable.

I consider it of the utmost importance that most of the straightening shall be done while the rails are hot. In other words, that the hot straightening shall be conducted so as to leave the minimum work for the cold press. Every blow of the gag is a bid for a break. The harder the steel the greater the danger. Moreover, gagging is apt to take out one bend by putting in two others, thus endeavoring to have two wrongs make a right. To bring the breaking danger down as low as possible, the cold straightening should be done before the rails are absolutely cold. At the same time if the rail goes under the cold press too hot the steel will not possess elasticity, and each blow will leave a dent; and if excessively applied the rail will be either wavy or lumpy. Such rails will of course make a rough track. Some mills in taking side bends out of their rails apply the gag to the flange. I cannot approve of this, and believe that it greatly increases the danger of broken rails. But after the rails are delivered to the trackmen they should not be carelessly thrown from the cars. This was not the practice with the early steel rails. The drilling should be accurate, and if proper drill presses and drills are used it can be done. If the holes are to be anything, from $\frac{1}{32}$ under to $\frac{1}{16}$ over size, I do not see any use in naming the diameter in the specifications.

So long as the purchasers of rails exact a guarantee from rail makers, I think the chemical composition of the steel should be largely left with them. But if the purchaser believes that carbon is the best hardening element for steel, it is not unreasonable to ask for as much as the maker is willing to put in, knowing what proportions of other elements his metal will contain, and still guarantee his rails. No doubt as the sections are increased harder steel can be safely used. The mere replacing of a broken rail with a whole one may fall far short of the damage sustained by the road on whose track the accident has occurred, leaving the danger to human life out of consideration. Therefore the purchaser has a right to insist upon some precautions being taken to avoid as far as possible such disasters. And these precautions, if correct ones, are also in the interest of the makers. Steel rails are made very rapidly, and the demands of the trade necessitate that they shall be made very cheaply. The workmen are paid by the piece, and while generally making good wages, they must produce a large tonnage to realize them. No matter how desirous the general management may be of producing only good work, it is very necessary that safe guards should be provided. Most makers have these in some form, but there are mills where the chances are taken.

The tests which I prefer are those I used for 15 years at Troy. My experience gives me confidence in them. I do not wish to say that Troy rails have never broken in service, but such accidents have been very infrequent, and could almost always be traced to individual mechanical causes. This plan of making tests has the merit of furnishing a check on the grade of the steel early in its manipulation; and I consider it more convenient than any drop test, and at least equally efficient.

As may be generally known, the Troy works have for years made a very wide range of Bessemer steels. From 0.05 per cent. to 1 per cent. of carbon; and we were fortunate enough to have considerable reputation for our success in so doing. On the higher grades, where great accuracy was required, it was my practice to have a test ingot taken to represent every 15-inch ingot cast. This accomplished two results—it made the workmen careful and let us know of any variations which might occur. I do not think this extra precaution necessary in making rail steel in any works where ordinarily good practice prevails, and I should most certainly discourage any of my clients from contracting for rails with others.

As has been proven by the fracture of many ingots, the steel in cooling, if the ingot is left upright until the interior steel sets, will form a funnel-shaped cavity in its top end. But if the ingot is thrown upon its side before that metal has solidified, this cavity will extend lengthwise, the distance being limited by the condition of the interior steel. Hence it is manifest that ingots should not leave an upright position before the metal has set sufficiently to prevent this cavity from so extending. Everything is against this lengthwise defect being taken out by the subsequent rolling of the ingot, and it will most probably cause pipes and cold shuts in the rails; but if the cavity is maintained at the top end of the ingot it can be cut off. Again, if ingots are drawn too soon from the pit and thrown upon their sides, there is danger of the crust which has formed at the top end breaking and permitting the interior liquid steel to escape or "bleed." That will certainly make a pipe.

It is only from sound and compact ingots that we can hope to produce good rails. Such ingots only can be made by care in casting them. Therefore, the careful steel-maker will not only use good molds, but also exercise a close supervision over the manner of pouring the heats. When from any cause this is not or cannot be done the resulting ingot should not go into No. 1 rails. Nearly every manufacturer uses somewhat different sized ingots, and frequently they vary in their shape. Of course each one follows the practice which under the controlling circumstances seems to yield the best results. It is well known that the same length ingot will not always roll equally well. I have found, when the metal was cracking badly in the blooming rolls, good results to be at once obtained by pouring the ingot shorter. Of course this is easily explained, and points to the necessity of closely watching and controlling the temperature of the "blow" in the converter. And I fully believe that a strong influence on the quality of the resulting steel rests at this very point.

As every ingot, if properly handled, has more or less of a cavity at its top end, therefore the bloom rolled from it will be piped or spongy at that end. To be certain of having a sound rail made from the upper part of the ingot, a sufficient length must be cut off to remove this spongy steel. These pieces need not necessarily be treated as scrap, there being many purposes for which they will answer.

It is not necessary for me to tell this institute that care should always be exercised in heating steel. As the carbon is increased, so is the danger. I believe more unsatisfactory rails can be traced to over-heat in the furnace than to any other one cause. I commend our fellow-member William Metcalf's paper, "Steel; its Properties; its Use in Structures and in Heavy Guns," read before the American Society of Civil Engineers March 2, 1887, to the careful consideration of every steel maker and user. It is, in my judgment, worthy to be considered a text-book on the treatment of steel.

My investigations of the service of thousands of tons of rails, and the analyses of many hundreds of them, have shown the greatest variation in the wear of rails of the same section and chemical composition. This being so, there must be some physical cause. Can we find a chemical reason for rails showing "soft" in wear, having the following chemical composition?:

Carbon	0.39
Sulphur	.059
Phosphorus	.085
Manganese	.722

If so, why did another make, in the same track and under seemingly the same conditions, analyzing as follows, wear "hard?":

Carbon	0.40
Sulphur	.064
Phosphorus	.080
Manganese	.779

I could multiply these instances to an indefinite extent, but will not take up time. Our Bessemer friends are all right on their chemistry. They know a great deal more than the people who made those early good rails, and it is not in that direction that investigation is most needed.

As I said early in this paper, every rail-maker wants to give his customers good rails. Now, I honestly believe it is to his interest that the purchaser should be represented by intelligent inspection. No matter how good the mill organization may be, the men all work by the ton, and do not always realize the importance to their own interests (which are the same as their employers), that only good work should go out. Hence, the right kind of inspection is of assistance to any mill. If I were a purchaser of rails, I should draw fuller specifications than these, which I now have the honor to present to you, and I should accept all the risk of the results. But railway managers are not yet willing to assume this position. I have, therefore, endeavored—while not relieving the makers of any responsibility, or intro-

ducing novel practices—to assist the railroads in obtaining better and more uniform rails.

It is recognized as the commercial rule that rail-makers should give a guarantee with their rails. In these specifications I have embraced such an one as is given by some of the largest makers in the country, and under which they have sold rails for many years. It seems to me to be fair in its provisions, and I believe the other requirements of my specifications will tend largely in the direction of making the sellers safe in the guarantee. If this is so, the railroads will, of course, receive satisfactory rails, and everybody ought to be happy.

HUNT'S SPECIFICATIONS FOR STEEL RAILS.

Section.

SECTION 1.—The section of the rail rolled shall conform to the template furnished by the railroad company with an allowance in hight of 1-64 inch under, and 1-32 over, being permitted in a delivery of 10,000 tons of rails. The fit of the fishing or "male" template shall be maintained perfect.

SEC. 2.—The weight of the rail shall be kept as near to pounds per yard as is practical after complying with Section 1.

Lengths.

SEC. 3.—The standard length of rail shall be 30 feet at a temperature of 60° F. Shorter rails of lengths will be accepted to the extent of 10 per cent. of the entire order. A variation in length of ¼ inch longer or shorter than the above specified lengths will be allowed.

Finish.

SEC. 4.—The rails must be free from all mechanical defects and flaws, and shall be sawed square at the ends, and the burrs made by the saws carefully chipped and filed off; particularly under the head and on top of the flange. In sawing care must be taken to avoid a flow of steel which will produce a swell on the top of lower flange, as the rail lies under the saw, thereby affecting the fit of the fish-plate.

SEC. 5.—The rails shall be smooth on the heads, straight in all directions, both surface and line, and without any twist, waves or kinks, particular attention being given to having the ends without kinks or drop. The hot straightening shall be carefully done, so that gagging under the cold press will be reduced to the minimum, and so applied that the rails shall not be made "lumpy."

Drilling.

SEC. 6.—Circular holes inch in diameter shall be drilled through the web at inches from the bottom of the flange. The center of the first hole inches from the end of the rail; and inches from the center of the first to the center of the second hole, and so on if more than two holes are required. These holes must be accurate in drilling in every respect, and left without burrs.

Branding.

SEC. 7.—The number of the charge, the name of the maker, the month and year of manufacture, shall be marked in plain letters and figures on the side of the web of the rail in such a position as not to be covered by the fish-plates when laid in the track. If the purchaser prefers, the number of the charge shall be stamped on the end of the rail.

Percentage of Carbon.

SEC. 8.—The steel to contain as high a percentage of carbon as the maker is willing to put in and still meet the requirements of sections 9 and 21.

Tests.

SEC. 9.—While the heat is being cast, two (2) test ingots shall be made. The first from steel going into the first regular ingot, the other from metal representing the last one. These test ingots shall be 3 x 3 inches and not less than 4 inches long. From them bars at least ½-inch square shall be drawn at one heat by hammering. Each bar when cold shall be bent, without breaking, by the blows of a sledge to not less than a right angle. Should one bar from a heat fail and the other stand the test, a third bar may be taken from a bloom rolled from the same ingot represented by the failed bar. If this stands the test it shall be accepted in lieu of the failed one. If the makers choose, more than the two test ingots may be taken, but they must be from the steel of the first and last regular ingots. If this is done and a test bar fail, another one may be drawn from the duplicate ingot and tested, and if it stands, accepted.

Treatment of Ingots.

SEC. 10.—After the ingots are cast they shall be either constantly kept in an upright position until ready to be rolled, or else so maintained until the interior steel has had time to solidify.

SEC. 11.—No "bled" ingots, or ingots from "chilled" heats shall be used in the manufacture of rails under this contract.

SEC. 12.—No ingots from badly teemed heats shall be used, excepting as they shall be subject to the provisions of section 16.

Cutting of Blooms.

SEC. 13.—After cutting off, or allowing for the "sand" or top end of each ingot, at least 12 inches more of seemingly solid steel shall be cut off that end of the bloom, or partially formed rail; if the latter, then the pieces so cut off shall equal 12 inches in length of a 7 x 7 inch bloom; a greater length than 12 inches being preferred; and if after cutting such length the steel does not look solid, the cutting shall continue until it does.

Heating.

SEC. 14.—Care shall be taken to avoid overheating the steel in shape of either ingots or blooms; and under no circumstances shall a "cinder" heat be allowed—that is, a heat high enough to cause the cinder to run off the steel as it is being drawn from the furnace. This does not apply to cinder which may be sticking to the under side of the steel, when drawn from a horizontal furnace, or to the bottom of an ingot when drawn from a soaking pit.

Inspection.

SEC. 15.—Inspectors representing the purchaser shall have free entry to the works of the makers at all times while this contract is being filled, and shall have all reasonable facilities afforded to satisfy them that the rails are being made in accordance with these specifications. The makers shall furnish them with the carbon determinations of each heat, if so required.

SEC. 16.—The inspectors shall have power to reject rails made from insufficiently sheared blooms, or from heats the test pieces of which have failed, or from badly poured heats, or from "chilled" heats, or from "bled" ingots. The rails made from uncut blooms, if otherwise perfect, to be received as No. 1 short rails, if sufficient lengths have been sawed off to make an amount of steel equal to the original demand of 12 inches. The rails made from heats, the test pieces of which have failed, may be accepted as No. 2 rails. The rails from a badly poured heat may be received as No. 2 rails, but, if made from a "chilled" heat or "bled" ingot, to be absolutely rejected. By an imperfectly poured heat is meant one which from any cause has been teemed without the control of the operator. A "chilled" heat is one which, from the steel chilling, has to be either pricked or poured over the top of the ladle. A "bled" ingot is one from the center of which the liquid steel has been permitted to escape.

SEC. 17.—Imperfectly drilled, straightened or chipped or filed rails shall be rejected, but will be accepted after being properly finished.

SEC. 18.—Rails failing to comply with section 1 will be rejected as No. 1 rails.

No. 2 Rails.

SEC. 19.—The requirements of No. 2 rails shall be the same as for the No. 1, excepting they will be accepted with a flaw in the head not exceeding ¼ inch, and flaws in the flanges not exceeding ⅛ inch in depth, and may have been made from an imperfectly poured ingot or heats from which the test bars have failed.

SEC. 20.—No. 2 rails to the extent of per cent. of the whole order will be received.

Guarantee.

SEC. 21.—The rail makers to guarantee the No. 1 rails against breakage and unusual wear at the ends or elsewhere for five years from the time of delivery to the railroad company; and should any such rails so fail, will, upon the return of such failed rails to their works, deliver free of cost on cars at their works perfect rails to replace such failed rails, the failure of which is not attributable to improper laying or want of care after being laid, or unusual circumstances of derailment from failure of other railway machinery or appliances, or negligence of the railroad company's employees. In event of failure at the ends or elsewhere of the No. 1 rails, not exceeding 10 per cent. of the amount of the contract before the expiration of five years' guarantee (and when the rails in all other respects warrant such a course), the railroad company will cause to be cut off so much of such rails as may be necessary to make perfect rails of them, but in no case leaving them less than feet in length, the maker to pay in cash for cutting, redrilling and restraightening such rails. The loss in weight so sustained by the railroad company to be made up to them by the makers on the return to them of the pieces so cut off in good and perfect full-length rails of such section as may be agreed upon. The points of delivery of failed rails, ends of rails cut off and rails to replace the same, or mode of such settlement, may be varied to conform to the peculiarities of each contract.

A Copper Syndicate Contract.

We reproduce below one of the contracts between the famous copper syndicate and one of the Lake Superior mining companies:

Agreement made this 19th day of April, in the year 1888, by and between the Atlantic Mining Company, of New York, a corporation organized and existing under the laws of the State of Michigan, hereinafter called the sellers, and La Société Industrielle Commerciale des Métaux de Paris, hereinafter called the buyers, witnesseth: The parties hereto having, in consideration of the sum of $1 to each of them in hand paid by the other at or before the ensealing and delivery of these presents, the receipt whereof is hereby acknowledged, and for other good and valuable considerations to them thereunto moving, mutually agreed together as follows:

1. The sellers herein agree to sell, and hereby do sell, to the buyers the entire copper output of their mines for about three years, commencing May 1, 1888, and ending December 31, 1890, estimated at 4,500,000 pounds of refined copper for each of the three years, and at all events not to exceed this amount per year, deliveries by sellers during 1888 not to exceed two-thirds of the above stipulated amount.

2. The price of such copper to be 13 cents per pound cash on delivery in New York, and in addition such sum as shall be equal to one-half the net profits realized above this price on resales thereafter made of said copper as hereinafter provided.

3. The copper is to be made by the sellers and delivered to the buyers in any shape or shapes or sizes ever made by the Detroit and Lake Superior Copper Company, which the buyers may desire and designate according to schedules to be furnished to the sellers by the buyers through Jere Abbott & Co., of New York, provided such sizes can be made of the company's mineral by the smelting works, but in the absence of schedules the copper is to be put into ingots.

4. The copper shall be delivered by the sellers in New York City free on board ship or at warehouse for storage as the buyers may direct.

5. Under the sole direction and control of the buyers, the sellers, when so requested, will act for them without charge or commission in selling, invoicing and collecting payments for any of this copper which the buyers desire to be resold in the United States, and such copper may be forwarded directly from the smelting works to any required point, the delivery of same at New York as provided in article fourth being waived by the buyers.

6. Payments to the sellers by the buyers hereunder shall be made cash on delivery or on tender of the shipping or storage documents—namely, bill of lading or warehouse receipt and Detroit and Lake Superior Mining Company's certificate of weight.

7. The copper shall be produced and delivered as nearly as possible in equal monthly quantities.

8. The sellers are not to be held responsible for failure to deliver at any time caused by strikes of workmen in their own employ or in the employ of others, accidents at the mines or works, lack or interruption of transportation or any other causes beyond their control.

9. It is also understood that the estimate of production herein stated is greater than the average annual production of the sellers mines, and, on this account, the sellers are not to be held liable for failure to deliver the full quantity herein mentioned, provided there shall be any failure of production of the mines.

10. Any deficiency of production in any one year is not to be added to the production of the following year; but this applies

only to deficiency of production and not to delay in transportation.

11. Upon the execution and delivery of this contract, the buyers agree to deliver to the sellers a letter of credit of satisfactory bankers for amount of all purchases under this contract, down to May 1, 1889, which letter of credit shall provide for payment by the bankers, on tender or delivery to the bankers of the documents above specified; such letter of credit to be availed of by the sellers for such portion of the copper as is not resold through them in the United States; and at least 30 days before May 1, 1889, the buyers shall furnish to the sellers an additional letter of credit, which shall be similar in form and substance and cover all purchases made and delivered hereunto until May 1, 1890, and at least 30 days before May 1, 1890, the buyers shall furnish to the sellers an additional and similar letter of credit covering the balance of all purchases and deliveries made under the said contract; it being understood and agreed that the sellers will not draw on or against any of the credits so given except after demand of payment on the buyers or their agents and default therein. It is further understood that in no one month shall the said credit be drawn against for an amount greater than the contract price of the proportionate delivery of copper for such month under this contract.

12. The sellers agree to guarantee all the sales that shall be made by them hereunder for the buyers, such guarantee to extend only to a guarantee of the cost price to the buyers of said copper under this contract, but no further; it being the intention hereof that to the extent which the sellers resell the said copper for the buyers, they shall release the said buyers from any further obligation to account to them therefor, but the said sellers, in case of loss by any such sales, shall not be bound to compensate the said buyers for any loss of profit arising to them thereby.

13. The sellers in addition to the price of 13 cents per pound, herein agreed to be paid by the buyers for copper delivered hereunder, shall be entitled to receive from the buyers one-half of the net profits that shall accrue by reason of resales of the said copper either by the sellers as agent for the buyers or by the buyers either in the United States or elsewhere after deducting storage, ocean freight, insurance, charge for interest at the rate of 6 per cent., and all other charges, including brokerages, but no commission shall be charged by either party for effecting such resales.

14. The said sellers shall render monthly accounts of all productions of their mines and of all resales made by them hereunder as the agents of the buyers, and the buyers shall also account for all resales made by them; and settlements of profits arising from resales by either party shall be made quarterly.

15. Messrs. Jere Abbott & Co., of New York City, are hereby nominated as agents for the buyers to receive for them notice of shipments and demand of payment, and to give direction as to the delivery, and to receive tenders, and to direct as to resales, and to receive shares of profits arising by said resales, and generally to act for the said buyers in all matters in connection with this agreement; and on the failure of the said Jere Abbott & Co. to act as such agents, the bankers named in said letters of credit shall be considered and hereby are acknowledged as agents of the buyer for those purposes.

16. It is further mutually agreed between the buyers and the sellers that all matters of differences arising with reference to the obligations of this contract or the interpretation thereof shall be submitted to three arbitrators resident within the United States, one of whom shall be appointed by the buyers, another of whom shall be appointed by the sellers, and a third of whom shall be selected by the two arbitrators thus appointed, and that the said arbitrators shall promptly hear, and a majority of them determine, all such questions of difference and make their award in writing, which award shall be binding upon the parties hereto.

In witness whereof the said Atlantic Mining Company of has caused these presents to be sealed with its corporate seal, and the same to be subscribed in duplicate by its treasurer, and the Société Industrielle et Commerciale des Métaux de Paris has.

ATLANTIC MINING COMPANY,
By JOHN STANTON, Treasurer
SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE DES MÉTAUX.
E. SECRÉTAN, Administrateur-Directeur.

Identification of Dry Steam.

A paper of special value, presented at the Scranton meeting last week of the American Society of Mechanical Engineers, was by Mr. James E. Denton, on "The Identification of Dry Steam." We take pleasure in publishing in this issue several of the engravings which accompanied it, and need, perhaps, scarcely say that the interest attached to the subject makes its further consideration eminently desirable. The paper, as we explained in a brief reference to it in our report of the Scranton meeting of the society, was divided into two parts, the first dealing with experiments with steam jets, from the appearance of which the character of the steam was determined approximately, and the second giving general expressions for the instrumental errors of condensing calorimeters for testing the quality of steam. We will confine ourselves here to the first part alone which bears directly upon the published illustrations. Figs. 1 to 5, we would explain, are reproduced from photographs of steam jets under different conditions.

It will be understood that Mr. Denton's method of recognizing dry, slightly wet, or slightly superheated steam, consists in the scrutiny of a jet of steam flowing into the atmosphere. Mr. Denton explained that if a boiler can be made to generate steam which is a few degrees superheated, then by drawing off steam at the end of a pipe of sufficient length the loss of heat by the pipe may be made to so nearly equal to the amount of the superheating that the steam will issue from the pipe in exactly the saturated condition. In the case of these experiments, this method was adopted to obtain dry steam.

A 30 horse-power Harrison steam boiler, Fig. 6, was used, which, when not forced to its utmost steaming capacity, superheated its steam from 6° to 12° F. To the top of the steam space of this boiler an inch pipe, *a*, *a*, *a*, about 40 inches long was attached as shown in the figure. This pipe led to a 1¼-inch tee, *b*, to which were connected the several outlets used and the thermometer and steam gauge A. At B was a stop-valve, and at C another thermometer and steam gauge. All of the pipe *a a* up to the tee was heavily protected against loss of heat by asbestos paper, 2 inches of hair felt and canvas. When the thermometer C showed 8° of superheating, the loss of heat from the pipe would make thermometer A show 2° of superheating, both steam gauges A and C showing exactly the same pressure.

By raising the water in the boiler to the top of the gauge-glass and increasing the quantity of steam generated by the boiler, the superheating at thermometer A could be made to vary from 2° F. to zero, and the steam referred to herein as dry steam was such steam as flowed through the pipe *a a* when thermometer A showed less than 2° but more than 0° of superheating, with reference to the pressure common to the gauges at A and C respectively.

Experiment 1.—The tee *b* was fitted at its under side with a draining pipe terminating in a petcock. Into its ends were screwed ⅜-inch pipe plugs prepared as follows (see Fig. 7): The square hub to which a wrench is intended to apply was turned off, and a hole $\frac{3}{16}$ inch in diameter drilled through the center of the plug. A hole $\frac{7}{16}$ inch in diameter was then drilled in the inside end of the plug, so as to leave a thickness of metal at the outer end of $\frac{1}{16}$ inch. The $\frac{7}{16}$-inch hole is then practically an orifice in a "thin plate," and removes the possibility of any of the heat of steam flowing through it, being employed in overcoming friction against the passages leading to the point where the steam issues into the atmosphere. Thus arranged, dry steam at 55 pounds gauge pressure flows into the atmosphere of a boiler room in a jet which is perfectly transparent over about ¼ inch of distance from the orifice. Fig. 5 shows a jet for 95 pounds gauge pressure.

Experiment 2.—For the thin orifice in the end of tee *b* there was substituted a piece of ¼-inch gas-pipe, *d*, Fig. 6, about 4 inches long, upon which was mounted a hollow copper drum, *e*, about 3 inches diameter and ⅜ inch in length. On the outer end of the gas-pipe was a brass cock, *f*, 2 inches long. The bore of the pipe and cock was about $\frac{3}{16}$ inch. The drum *e* was fitted to receive a stream of water at *g* and allow it to flow off at *h* after subjecting the pipe *d* to a certain refrigerating effect. Thermometers at *g* and *h* graduated to fifths of a degree F., determined the temperature of the water at its entrance and exit to the condenser. The thin orifice at the side of the tee shows the transparency of the "dry steam" for ¼ inch from the orifice. The jet issuing from the cock *f* is a bluish-white color clear up to the orifice, due to the cooling loss of heat in passing through the 6 inches of ⅜-inch pipe and cock.

Upon passing water through the condenser so as to maintain it at an average temperature of 74½° F., the end jet became distinctly white, the jet at the side certifying by its unchanged appearance that the steam operated upon was also unchanged in quality. The heat abstracted per minute was determined to be 12.75 British thermal units. The steam flowing* per minute was determined to be 1.13 pounds. The latent heat of steam at 55 pounds gauge pressure being 822 British thermal units, 1.13 pounds of steam would possess 929 units of latent heat, which if completely absorbed by refrigeration would cause the 1.13 pounds of steam to become liquid water at the temperature corresponding to 55 pounds pressure. Hence the absorption by the circulating water of the 12.75 British thermal units may be assumed to cause $\frac{12.75}{929} \times 100 = 1.4$ per cent. of the steam to liquefy.

Fig. 1 shows the effect of circulating iced water through the cooling drum, thereby maintaining it at an average temperature of 54° F. The heat abstracted per minute was 18 British thermal units, the flow of steam was practically the same, so that the view exhibits the appearance of a jet of steam at 55 pounds pressure containing 1.94 per cent. of liquid water. A jet at 95 pounds gauge pressure being maintained at 76° F., 26.27 thermal units were abstracted from it per minute, and the flow of steam was 1.75 pounds per minute. Fig. 2 exhibits the appearance of this jet, which by the above data contains 1.88 per cent of water.

*This was determined by attaching cock *f* to a Wheeler surface condenser, S, and determining the flow for a period of about half an hour, and weighing the condensed steam by a spring balance, *k*.

FIG. 1.—Steam at 55 Pounds' Pressure Containing 1.94 per cent. Water.

FIG. 2.—Steam at 95 Pounds Pressure Containing 1.88 per cent. Water.

FIG. 3.—Steam at 55 Pounds.—Boiler Priming Violently.

PHOTOGRAPHIC REPRODUCTIONS OF STEAM JETS.

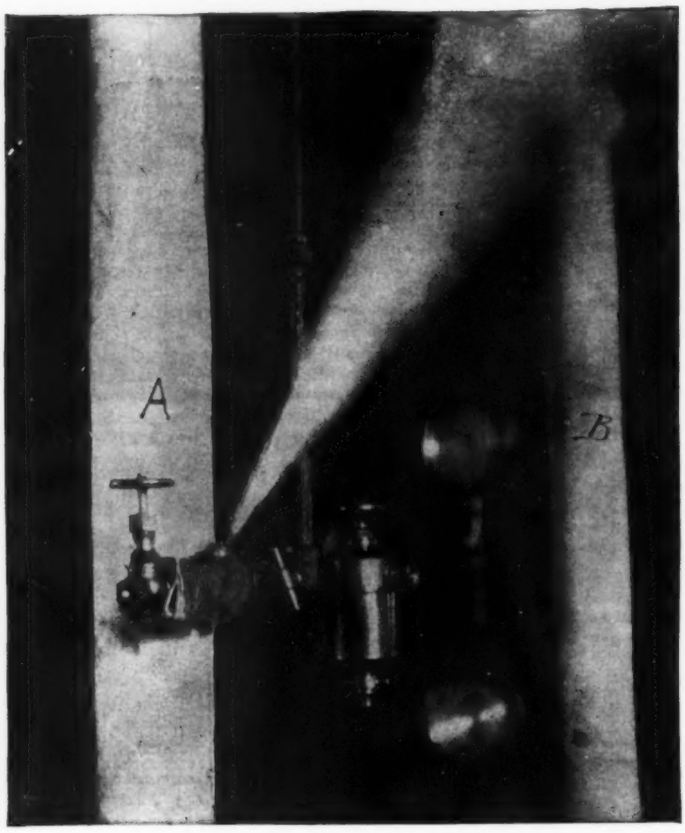


Fig. 4.—Dry Steam after Traversing 100 Feet of Covered Pipe at Velocity of 50 Feet Per Second.

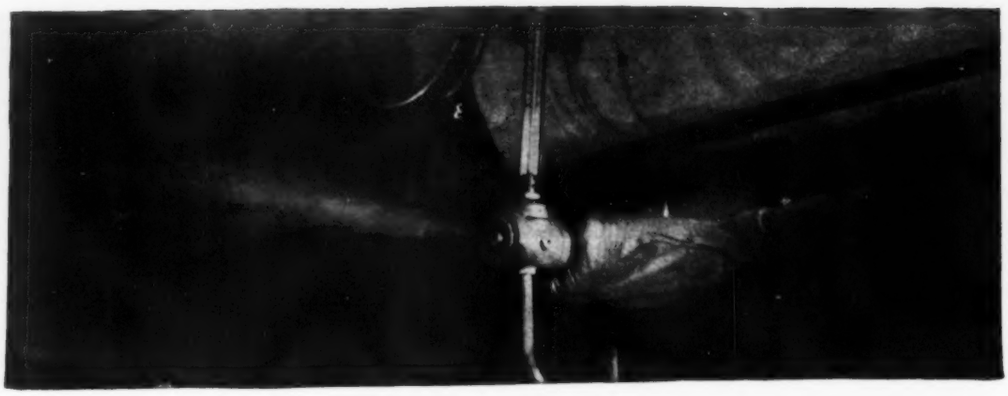


Fig. 5.—Dry Steam at 95 Pounds Pressure.

PHOTOGRAPHIC REPRODUCTIONS OF STEAM JETS.

Experiment 3.—Jets of dry steam at 55 pounds being uniformly flowing, the level of the water in the boiler was gradually raised beyond the top of the water-glass until the water was about 8 inches from the top of the steam space of the boiler, when periodical gusts of white mist commenced to occur in both the end and side jets, and engines taking steam from the boiler received so much water in their cylinders that they could no longer run with safety. A view of one of such gusts was made by magnesium flash light with the result shown in Fig. 3. While the feed pump was working, the priming denoted by these gusts continued. The jet returned to steady action and normal appearance within a few seconds after the feed pump was stopped, notwithstanding that the boiler was almost completely full of water.

Experiment 4.—The boiler being steadily making steam 8° superheated and supplying the same to an engine through about 100 feet of 2½-inch pipe, newly felted with 1 inch thickness of hair felt, a jet of steam was made to blow through a petcock about 2 feet above the throttle valve on the steam chest of the engine. Fig. 4 shows the appearance of the steam when the engine was running with a total steam consumption of about 600 pounds of steam per hour. The jet 4 was so laden with water that it flowed with irregular gusts, resembling those occurring when the boiler was priming (Fig. 3), but of less violent character. And yet the boiler was making slightly superheated steam, as proven both by the thermometer at C (Fig. 6) and the transparent appearance of the jets from the apparatus at the boiler. The explanation of this paradox is as follows: The steam pipe to the engine runs beneath the engine foundation from the boiler to a point below the vertical pipe B; thence it rises in B, and finally runs vertically downward to the engine in A. When the engine is stopped, the water condensed by the pipe remains at the bottom of B, and the jet contains only a gray mist. When the engine is running, the water of condensation is swept along with the steam with sufficient power to cause it to be carried up B, and show the wetness of Fig. 4. A valve placed at the lower end of B to drain the water out of the pipe will prevent the wet appearance of the jet in Fig. 4 when a feeble current is passing through A and B, but such drainage fails sensibly to alter the appearance in Fig. 4, when the velocity through the pipe is 50 feet per second.

We will repeat here the conclusions at which Mr. Denton arrived: It appears from the investigation that jets of steam show unmistakable change of appearance to the eye when steam varies less than 1 per cent. from the condition of saturation either in the direction of wetness or superheating.

The mathematical investigation showed that the instrumental error of portable condensing calorimeters does not theoretically interfere with the measurement of about 1 per cent. of variation in the heat of saturated steam. But in the use of such calorimeters there has always been found to exist an accidental variation or error considerably in excess of the theoretical instrumental error, even Regnault's magnificent work not being an exception in this respect. Consequently if a jet of steam flow from a boiler into the atmosphere under circumstances such that very little loss of heat occurs through radiation, &c., and the jet be transparent close to the orifice, or be even a grayish-white color, the steam may be assumed to be so nearly dry that no portable condensing calorimeter will be capable of measuring the amount of water in steam. If the jet be strongly white the amount of water may be roughly judged up to about 2 per cent, but beyond this a calorimeter only can determine the exact amount of moisture. A common brass pet cock may be used as an orifice, but it should, if possible, be set into the steam-drum of the boiler and never be placed further away from the latter than 4 feet, and then only when the intermediate reservoir or pipe is well covered.

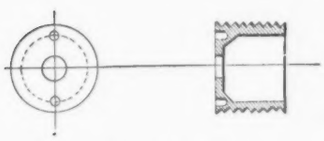


Fig. 7.—Details of Side Orifice.

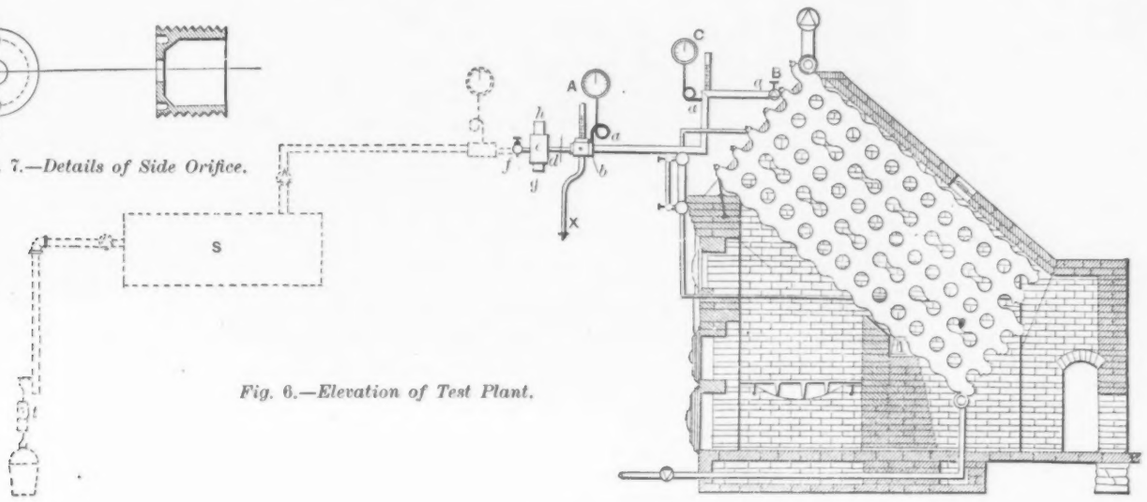


Fig. 6.—Elevation of Test Plant.

THE IDENTIFICATION OF DRY STEAM.

The Gunboat Petrel.

Following the Yorktown, the Vesuvius, the Charleston and the Baltimore, the fifth of the vessels added by Secretary Whitney's administration to the new navy, the Petrel, was recently launched at the yard of the Columbia Iron Works, at Baltimore. The name, one of the prettiest and most suitable that could be given to a small vessel, is not wholly new to our navy, although, we believe, never before conferred in it on a craft expressly constructed as a warship. It was borne both by a small schooner, built like the present vessel in Baltimore, and employed in the Mexican war, and also by a steam vessel purchased from the merchant marine and fitted up with a battery for service in the civil war. But the new Petrel, though having a displacement of only about 885 tons, and classed in the legislation authorizing her construction as a light gunboat, is an effective cruiser, built on an approved modern plan, and capable of better service than some larger vessels of the old navy which she is helping to replace. With a length between perpendiculars of 175 feet, a breadth of 31 and a mean draft of not quite 12, the Petrel will be supplied with engines of about 1350 indicated horse-power under freed draught, with which she will probably attain a speed of about 13 knots. This machinery is now ready for her, so that it is thought that she will be complete for trial within from two to three months. Like the other new vessels, she is provided with a curved steel deck for the protection of her engines and boilers, and is also divided by steel bulkheads into numerous water-tight compartments, so as to minimize the injury done by the penetration of shot. Her main battery consists of four six-inch, high-power, steel breech-loading rifles, so mounted in sponsons as to have a wide sweep. She will also have a secondary battery consisting of two revolving cannon, two rapid-fire guns and a Gatling. She will have a barkentine rig and sail power for ordinary cruising where steam is not required.

Compared with the Charleston and thl Baltimore, the Petrel is seen to be a small craft of inferior speed. But her cost is only one-fourth that of the former vessel and less than one-fifth that of the latter. It is rather noticeable that for general cruising purposes no other vessels so small have been asked for since the Petrel was authorized in the spring of 1885, and it has been suggested that she may prove to be the only one of her class, as the Dolphin will certainly be the only one of hers. Still, with her light draft and good battery power, the Petrel will no doubt find her sphere of usefulness. The new composite ship, to be used as a practice vessel for the midshipmen of the Naval Academy, will be somewhat near the size and cost of the Petrel. The Vesuvius is also of similar small displacement, but has very high speed. It cannot be long now before the Petrel and her four predecessors will join the four Roach cruisers. The coming winter will probably see the Yorktown, the Vesuvius, the Charleston and the Petrel completed and tried. Indeed, for the future, trial trips rather than launchings will be eagerly watched for, and the results will be of value to Congress in guiding its legislation for new construction during the next session.

The rate on bar iron from the Mahoning Valley, Ohio, and the Shenango Valley, Pa., to Memphis, Tenn., has been reduced 2 cents per 100 pounds. The new rate went into effect on Saturday, the 20th inst., and was made at the request of the New York, Pennsylvania and Ohio Railroad.

THE MECHANICAL ENGINEERS'

SCRANTON MEETING.

Second Notice.

The afternoon of Wednesday, October 17, as outlined in our report last week, was again devoted to excursion to different establishments in Scranton. The first stop was made at the locomotive shops of the Dickson Mfg. Company. The various stages in the erection of locomotives were there exhibited, considerable attention being attracted by the hydraulic flanging of locomotive boiler heads. Other departments of the works, such as the engine erecting shop and the foundry, were also visited, a large Wheelock engine in course of erection in the former exciting particular interest. A special invitation had been issued to visit the works of the Scranton Packing Company, where a refrigerating plant of the absorption type was being tested. The machinery there was examined with a good deal of interest. Perhaps one of the most novel experiences during the trip was the descent into the Pine Brook Colliery and the ascent into the coal breaker. The mine shaft is nearly 300 feet deep. Carriages then conveyed a large number of the party to the works of the Boies Steel Car-Wheel Works. The wheels there turned out consist of cast-iron hubs and steel tires, the wheel disks each being made up of two steel plates securely bolted together, the whole making apparently a very substantial and elastic wheel. The wheel disks are of a peculiar shape calculated to give great resisting power, and are formed in a hydraulic press. All the details of manufacturing the wheels were exhibited and attentively followed.

Wednesday Evening.

The evening session was opened by a paper by Prof. J. Burkitt Webb, on the "Overhauling of a Mechanical Power." Professor Webb undertook to show that there was no such law, or its converse, as that proposed by Professor Ball in his "Experimental Mechanics," in which the following statement is made: "The principle which we have here established (with respect to a differential pulley block) extends to other mechanical powers, and may be stated generally: Whenever rather more than half of the applied energy is uselessly consumed by friction, the load will remain suspended without overhauling."

The paper was briefly discussed by Mr. Oberlin Smith, and was followed by Professor Webb's second paper on "The Mechanics of the Action of the Injector." To this we will refer more in detail in another issue. In the resulting discussion, a communication was read from Mr. Wm. Kent, who took the stand that, while the injector was a poor machine for lifting water, its efficiency was almost perfect, so far as forcing water into a boiler was concerned. Comparing the efficiencies of pumps and injectors, Mr. Denton pointed out that in a pump where there was practically no expansive working of the steam the performance was much superior to the work of an injector, even though for this latter a card might properly be drawn showing a much greater available area of work done.

We omitted to state last week that among the papers presented and discussed on Wednesday morning was one by Mr. F. A. Scheffler, entitled, "A Foundry Cupola Experience." This was a continuation of a paper by the same author, presented at the Nashville meeting of the society, its purpose being to answer the questions raised in discussing it at the time.

In discussing this paper, Mr. W. F. Durfee referred to the waste of fuel, in the shape of carbonic oxide gas, ordinarily going on in foundry cupolas. This, he explained, was overcome in a new type of cupola by the introduction of a set of auxiliary tuyeres which introduced air at different levels and prevented carbonic oxide from again forming, due to the presence of coal.

Wednesday evening having been specially set down for the discussion on "Steel Phenomena," this subject was then taken up and is presented at length elsewhere in this issue. The session was adjourned at 9.30 p. m. so as to enable the visitors to avail themselves of the invitation extended by the Suburban Electric Railroad Company to go over their electric road, three special cars having been provided for the purposes. It is not without interest to note here that Scranton was the first city east of the Mississippi to build a street car road to be operated exclusively by electricity. Commencing with a capital of $20,000, and 3½ miles of track in December, 1886, the Suburban Company now have over 5 miles in operation, with 20 cars. The first cars were built by the Pullman Company, and were considered at the time the finest street cars in the world. One of them was the show car of the Pullman Company at the Paris Exposition. The success of the Suburban has been followed by the forming of other companies. The Nay-Aug Crosstown commenced running last spring, the South Scranton Passenger Railway this fall. The People's line will soon be changed from horse-power to electricity, when Scranton will have about 25 miles of street railroad operated by electricity.

Thursday, October 18,

was given up wholly to an excursion, a special train leaving Scranton at 9 a. m., having been kindly provided on the Erie and Wyoming Railroad. The first stop was made at Hawley, the silk mills at that place having been thrown open for inspection. The mills are operated by water power and furnished a series of interesting studies. Leaving Hawley the train proceeded to White Mills, where the Honesdale Glass Works were visited. After dinner, which was served at Honesdale, the party were conveyed by the gravity cars of the Delaware and Hudson Company over the Moosic Mountain to Carbondale and back to Scranton through the Upper Lackawanna coal field. The pleasures of this journey at this time of the year, with the wooded mountains in full autumnal glow, can scarcely be fitly described, but must be experienced to be fully appreciated. Indications of the great wealth of coal in the region passed through are generally prevalent. In this connection the following short table of coal shipments will, no doubt, be examined with interest:

Coal Shipped from Lackawanna-Wyoming Valley.

	tons.		tons.
1880	11,419,279	1884	15,677,753
1881	13,951,383	1885	16,236,470
1882	13,971,371	1886	17,031,826
1883	15,604,492	1887	19,684,929

The output for the Wyoming region thus far this year, according to the Scranton Board of Trade, is 16,141,451 tons, being now 2,000,000 tons a month. At this rate the output would be over 25,000,000 tons, or fully two-thirds of the entire anthracite product for the year. Every strike in the Lehigh and Schuylkill regions has helped Scranton. To mine this coal, over 50,000 men and boys are furnished steady work the year round, and the companies pay out fully $4,000,000 cash each month in wages. With such a steady flow of wealth circulating through the arteries of this valley monthly, is it any wonder that its capital city must grow? The magnitude of the coal trade is more easily seen by reducing it to daily proportions. During the month of September there was sent out from the Wyoming Valley each working day 156,653 tons, equal to 522 trains of 20 cars each of 15 tons capacity. The increase has averaged about 1,750,000 tons yearly.

Though not in accordance with the original programme it was decided to hold

An Evening Session,

thus leaving Friday free so far as the consideration of professional papers was concerned. The session was presided over by Mr. Henry G. Morris, the first business being a number of announcements relative to an invitation which had been received to visit the Scranton Steel Works. The first paper was by Professor Hutton on

THE STRAINS ON AN ANNULAR LID RESISTING INTERNAL PRESSURE.

It appears that the occasion recently arose in Professor Hutton's practice to decide upon the strains in an annular casting, to which a flexible diaphragm was secured, when fluid pressure came normally upon the latter. A large cylindrical vessel, 73 inches in diameter, had to have a lid which could be easily opened, and should be light. It was therefore decided to make this lid of copper sheet, ⅛ inch thick, and to rivet this copper to a cast-iron ring, which would give the necessary stiffness to secure a steam-tight joint when bolted to the flange of the cylinder, and would allow of arranging a convenient hinge structure.

The interest of such a case to designers generally, and the advantage which it may prove to others to be able to refer to such an analytical investigation, induced Professor Hutton to request Mr. L. H. Rutherford, by whom it was undertaken, to consent to its publication in the society's "Transactions." The paper, we need perhaps scarcely say, was eminently mathematical in character.

There being no discussion, Mr. C. J. H. Woodbury's paper on "Electric Welding" was taken up. To this we referred more fully in our last issue. The paper, we may add here, embraced extensive tables of tests of welded specimens made at the Watertown Arsenal. The machines by which the welding is done were illustrated and described in *The Iron Age* of July 12, 1888. Mr. Woodbury showed a number of very interesting specimens illustrating the capabilities of the process. It may not be amiss to remark here that the Thomson Electric Welding Company, of Lynn, Mass., are applying it largely, and with eminent success, to the welding of carriage-wheel tires.

The discussion was opened by a written communication from Mr. Wm. Kent, who desired to know how it was that a ring could be welded, the natural inference being that the electric current would pass through the unbroken part of the ring in preference to taking the shorter path, embracing the resistance of the disjoined ends. Mr. Woodbury explained that as a matter of fact the greater portion of the current, depending upon the position of the clamps of the welding machine, took the shorter path regardless of the great resistance. Rough figures were given by Mr. Woodbury for the different values, the general nature of the question and the short time at disposal in replying preventing an exact statement. Mr. Oberlin Smith referred to the fact that he had successfully welded together pieces of tin plate, though the action in that case ought perhaps more properly be termed soldering, since the tin coating merely melted, and, on again solidifying, bound the pieces together. Mr. Smith referred also to the possible utility of the electric process in locally heating steel tools for hardening, especially where the parts to be hardened are small projections of relatively very large pieces, as, for example, the cutting points in dies, thus entailing danger of fracture from unequal expansion and con-

traction in the ordinary process. Attention was further directed to the circumstance that in butt-welding by the electric method the ends of the pieces to be joined were made convex; consequently, the union began at the center and proceeded outward, the flux being forced outward at the same time. Mr. Pope drew attention to the great utility of electric welding in joining electric wires, the union in all cases being perfect and immeasurably superior to the method in current use of twisting together the ends of the wires to be joined and then soldering. Incidentally he touched upon the question which had been raised as to whether iron and steel would be subject to burning when welded in this way, and stated substantially that there was no danger from this source, the temperature being under ready control. Mr. Woodbury, in closing the discussion, spoke, among other things, of a contemplated chain-making machine which would embrace an electric welding attachment.

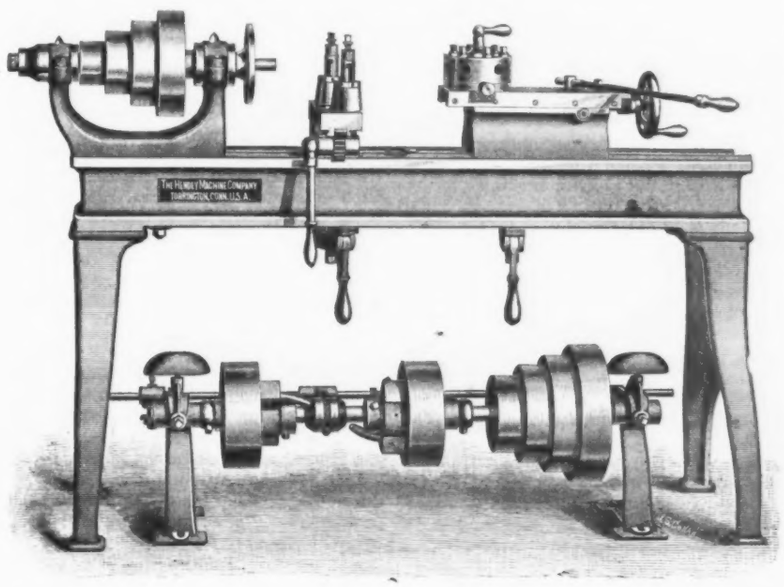
The list of papers having been exhausted, topical discussions were again taken up, the first being that relating to steel phenomena, which, as previously noted, had been commenced at a preceding session. In view of its consideration elsewhere in this issue we will not here refer to it further. A series of topics on power molding machines, bucket curves of modern turbines, speeds of hot-air engines and variation in pitch of screw threads as cut by dies in screw machines were presented but elicited practically no discussion.

A series of resolutions of thanks to the various organizations and committees who had extended courtesies and generally interested themselves in behalf of the society, and its guests closed the meeting. On Friday morning a visit was paid to the Scranton Steel Works. About 120 members were in attendance during the week. The papers and discussions, as usual, were interesting and profitable, and the different excursions were thoroughly enjoyed.

The Bolt and Nut Manufacturers.—The Bolt Manufacturers' Association of the United States held a meeting at the Hotel Anderson, Pittsburgh, on Wednesday, the 17th inst. The Nut Manufacturers' Association met at the same place the day previous. The members of one are also members of the other, but each organization is independent of the other. No agreement exists among the members as far as the prices of Nuts of a certain size are concerned. This is known as a base rate, and includes all products between certain numbers. Nuts below or above this scale are termed extras, and their selling price is not regulated by agreement. As a consequence, there is considerable cutting down by manufacturers in the price of extras. The principal subject of discussion related to this cutting of prices An effort to regulate the price for the products of all sizes was made by a number of the members. The attempt failed for want of unanimity as to what the fixed rate for each size should be.

New Turret Lathe.

The Hendey Machine Company, of Torrington, Conn., are putting on the market a new 15-inch turret lathe, shown on this page. The lathe is designed to take the place of a more expensive screw machine for a large variety of work. The turret



NEW TURRET LATHE, BUILT BY THE HENDEY MACHINE COMPANY, TORRINGTON, CONN.

side is moved by a lever and has a movement of 6 inches. The turret is revolved by drawing the stop-pin on the side and turning by hand, which is done as quickly as a full automatic turret, and, in some cases, quicker, as it is not necessary to pull the slide back as far as when on small work. The turret slide is also moved by a hand-wheel and screw and is set in the following manner: Take off lever and draw the slide back as far as possible. Tighten the nut on side of foot-block and it is ready for use. This makes a complete hand or speed lathe. The turret has six holes; the cut-off slide has two tool-posts and has adjusting stops for each tool. The turret slide also has an adjusting stop. The spindle has a ¾-inch hole through its entire length and front, and has a Morse taper for center. The boxes are of deoxidized bronze and the spindle is furnished with a face-plate. The weight of the lathe is 700 pounds and the bed measures 5 feet.

The regular monthly meeting of the Bessemer Steel Association was held at the Monongahela House, Pittsburgh, on Tuesday, the 17th inst. The attendance was fair, more than half the members being represented. Business was reported to be in a very satisfactory condition and the outlook very encouraging. No change was made in prices, nothing but routine business being transacted.

Treasury Decisions.

DUTY ON ADJUSTABLE CHAIN LINKS.

The claim of certain appellants that shackles or chain links are dutiable as malleable iron castings at 2 cents a pound and forgings at 2½ cents a pound instead of 45 per cent. is denied by the Treasury Department, on the ground that the articles in question, which are links for chains with movable bolts, so that the chains can be separated and adjusted by shortening or lengthening, are made wholly of iron, being first forged in a suitable size and shape and then manufactured and finished by further process of boring, &c., after which they are either japanned or galvanized, and that they are not now in the condition known as "forgings of iron."

NAIL FILES.

In a case of nail files the appellants claim that the articles in question are dutiable at the rate of 30 per cent. ad valorem, either as "brushes," under the provision therefor, or by assimilation to "manufactures of bone." The articles it appears were returned by the appraiser as "manufactures of metal and bone," and classified for duty under the provision for "articles * * * composed wholly or in part of * * * metal," which view has been sustained.

BEELTON SHANKS.

Having been assessed at 45 per cent. and the appellants claiming 25 per cent. duty as buttons, or at the rate of 35 per cent. ad valorem for "plated and gilt articles and wares of all kinds." * * * The appraiser reports that the articles commercially known as button-shanks are not button-molds, but small brass cups into which the molds are set in the manufacture of buttons, and which are not of the same character as the "shanks and collets" covered by the Department's decision of May 31, 1888, and are not plated or gilt articles. The assessment of duty is affirmed.

MANUFACTURES OF STEEL.

On an assessment of duty at the rate of 45 per cent. ad valorem on certain so-called "steel forgings" claimed by the appellants to be dutiable at 2½ cents per pound, as forgings of steel, and returned as manufactures of steel. It appears that the merchandise in question consisted of steel wire drawing-plate blanks, which were plates of steel that had been forged into the sizes and shapes desired preparatory to their further manufacture and completion for use as "drawing plates," but had not undergone any such further manufacture. The Department reversing the assessment says: These goods not having been advanced by manufacture beyond the condition of forgings are duitable as claimed by the appellants.

The Meldometer.—The meldometer, invented by Mr. John Joly, of Dublin, Ireland, is a simple instrument for observing the behavior of bodies at high temperatures, melting points, &c. The instrument fits the stage of a microscope, and consists of a platinum strip stretched between two clamps; a little of the material in a state of powder is put on the strip, a current is sent through it, and the resistance of the system adjusted until melting or boiling ensues. A carbon rod of more than a foot in length is placed vertically in a glass tube, and mercury enters the tube from below when a small reservoir connected with the tube by a piece of india-rubber pipe, is lifted; thus part of or all the carbon is cut out. A tap further serves to arrest or discharge the mercury. It is easy to melt quartz and other refractory material on this platinum strip.

THE WEEK.

An explosion occurred in the great manufactory of the American Pencil Company, in Jersey City, last Saturday. It was caused by the spontaneous combustion of red cedar wood dust, which, passing through the dust arrester, flew from the sawing room to the boiler room. There was a sharp explosion as the flue burst, and the flames flashed 300 feet into the sawdust heap in the boiler room. About 400 girls and men who were at work in the building escaped, with a single exception. The damage is estimated at $1200.

Pine straw bagging, made from the needles or leaves of the pine tree, finds favor among merchants and shippers at Charleston, and it is predicted that before another season 100 factories will be engaged in its manufacture.

A federation of miners of the Lake Superior district, including men of copper, iron and all other mines of Northern Michigan, Wisconsin and Minnesota, is now being organized.

Japan has nearly 100 daily newspapers. The first was started only 18 years ago.

A new street car motor run with gas made automatically from crude petroleum was exhibited in Chicago last week. The inventor claims that it is capable of a speed of 15 miles per hour, at a cost of less than $1 per day.

To remedy a quicksand on the West Shore Railroad in what is called the West Point tunnel, Chief-Engineer Katta is putting steel ribs and plates into the excavation for a distance of 140 feet, the former 15 inches wide and the latter 24 inches.

Favored by President Diaz, a New York syndicate have obtained control of the Mexican Mortgage Bank, the President being desirous of attracting American capital rather than European.

Some interesting statistics of the paper trade were given by Warner Miller in an address delivered at a banner-raising in Duane street about a week ago. The paper trade in this country represents a yearly product of nearly $95,000,000, and the articles made, of which paper is the so-called "raw material," amount to nearly $100,000,000 yearly. The value of paper is largely made up by the cost of labor in making it, for the various articles from which paper is produced will not average 25 per cent. of its total cost. The duty on writing and fine paper was 35 per cent. to the year 1883. It was then reduced to 25 per cent. See the result. For the fiscal year June 30, 1883, $55,448 worth of paper was imported, paying a duty of $19,407; while for the year ending June 30, 1887, there was imported $968,865 worth of paper, paying a duty of $242,216 —an increase of $222,809 in duty paid, and about $915,000 in value, or nearly 1700 per cent. in value and 1200 per cent. duty—a tremendous increase in four years.

A report from Mexico says American capitalists are about to introduce machinery for decorticating the ramie and cotton stock fibers of that country, and that, in consequence, Mexican estates will be enhanced in value.

The Select Council in Philadelphia has voted in favor of elevated railroads in that city, which is supposed to insure the success of the measure.

In response of the recent letter of General Master Workman Powderly, requesting an expression from local assemblies of the Knights of Labor on the necessity for Congressional legislation in regard to trusts, Local Assembly 1233, of Baltimore, sent a letter to President Cleveland. Thisletter asks him to send a message to Congress demanding immediate legislation to abolish all institutions that gamble in food, and, as a further protection to the masses, that all "trusts" be abolished. "We ask this action of your Excellency," says the letter, "as law abiding citizens, that there may not be a repetition of what has occurred when the people felt the oppression of organized bodies of avaricious individuals, who too often have been fostered and favored by representatives abusing the confidence of the people by favoring a class, to the exclusion of the people at large."

The Builders' Exchange, of Pittsburgh, has appointed a committee for the purpose of selecting a site for the erection of an exchange, to cost in the vicinity of $200,000. The building will be modeled after the plan of the Philadelphia, Boston and Chicago Exchanges. The basement will contain a trades school for the education of boys to be carpenters, painters, masons, bricklayers and all the arts appertaining to the building trades. The first floor will be a bank for the benefit of contractors, builders and architects. The second floor will be the exchange proper, where contractors and architects can meet and make agreements and where property owners can come and see about the erection of buildings. The third floor will be for the meetings of the exchange.

The magnates of the Southern Pacific and Central Pacific railroads are proposing to bridge the Carquinez Straits, an arm of the Suisun Bay, near San Francisco, and thus effect an entrance into the city without depending upon the big transport that now plies between Benicia and Port Costa, carrying trains from one side to the other. The exact location for the bridge has not yet been decided.

One of the jurors of the Brussels exhibition says American agricultural machines received "three diplomas of honor—the highest award—and one gold medal; in other words, there was awarded a diploma of honor for each exhibitor but one, and he really only deserved the gold medal. The other exhibitors fared equally well, for out of 73 *exposants* 54 got distinctions of greater or less degree. I think we have reason to congratulate ourselves."

The decision of the United States Court in Philadelphia adverse to the interests of silk manufacturers, by classifying ribbons among hat materials, and therefore subject only to a low rate of duty, excites severe comment. The manufacturers receive encouragement from the assurance from Washington that "it is the intention of the Department, as at present administered, to protect the revenues of the Government from loss by maintaining the classification which it has always insisted upon—namely, that these goods should pay duty at the rate of 50 per cent. ad valorem, and not at the low rate of 20 per cent. prescribed for hat materials, believing that when the question can again be brought before the Supreme Court the construction of the Department will be upheld."

The rapid growth of the Western Territories is shown by the annual reports just received in Washington. L. K. Church, Governor of Dakota, reports an increase gain in the population of the Territory during the year of 73,346 in a total population of 640,823. The quantity of land purchased for settlement was 2,500,000 acres. As to the discovery of tin in the Black Hills the Governor remarks that there is not to-day a producing tin mine nor a pound of Dakota tin in the markets. E. G. Ross, Governor of New Mexico, in his annual report says the questions of the settlement of land grant titles, water storage and irrigation are of the foremost importance to the development and future welfare of the Territory. He says that of the 79,000,000 acres, the area of the Territory, 60,000,000 may be classed as tillable with proper irrigation. The facilities of the Territory for storing water are unsurpassed. The present system of independent ditching must be abandoned and the Territorial government must assume jurisdiction of the water supply and its distribution. The population of the Territory has increased during the year about 10,000. The aggregate value of the taxable property in the Territory is given as $43,151,920. Of this amount $15,370,960 is in livestock, $7,466,869 in lands and $6,858,350 in houses and improvements. Edward A. Stevenson, Governor of Idaho, estimates the population of that Territory at about 100,000. The value of taxable property is given at $21,288,392, which, his report says, is less than one-half of its actual value in cash. About 460,000 acres of public land have been entered during the year. The agricultural productions for the year comprise 2,986,000 bushels of wheat and estates are valued at $2,800,000. A report from the United States Assay Office, at Boise City, shows the gold, silver and lead production of the Territory for the year to be $8,905,136, of which the gold was $2,522,209, the silver $3,422,657 and the lead $2,960,270.

Every modern man-of-war is now provided with powerful electric searchlights. They are of the arc pattern, usually ranging from 8000 to 30,000 candle-power, so arranged with reflectors that their rays can be concentrated into a single beam and thrown in any desired direction. With one of these lights of only 8000 candle-power no difficulty is experienced in illuminating a target more than two miles distant, rendering firing at night as easy and accurate as by day.

A "corner" in the diamond market is spoken of as possible if the four diamond fields in Africa could be worked as one concern. It is even declared that a combination will be necessary, on account of the glutted state of the market, as present values very nearly touch the cost of production. It is even possible, we are told, that the costly gem may be found in many fresh places and become so common that it will not pay to mine, unless some fresh use should be found for it similar to that for boring purposes—some practical use, in fact, that will consume a great many stones and keep up the price.

The explosion of the oil-tank steamer Ville de Calais, employed in the oil trade between Philadelphia and Calais, excites much interest in shipping circles, particularly among agents and captains identified with sailing vessels, who argue that further explosions will put a decided check upon the building of steamers to compete with them. Respecting the cause of the explosion, one of the parties interested says: "The tanks must have been full of gas, left after the 15,000 barrels of petroleum which she carried had been pumped out. And then there must have been carelessness in examining the tanks. The first thing done after emptying the tanks is to fill them with water. The petroleum still remaining rises on top, and, when the tanks overflow, runs out. It is then that the tanks are examined, and in doing this the same safety lamps are used that are used in mines. Even after the tanks are empty, if a careless sailor, after lighting his pipe, threw the match down the hatch, just such an explosion as rent the Ville de Calais asunder might ensue."

The Treasury Department has decided that a vessel cannot be legally regarded as having arrived at New York upon a given date upon evidence that she had passed Sandy Hook or Quarantine on the day in question. Adopting the opinion of the Attorney-General upon this subject, the

port of New York only includes so much of the water adjacent to the city as is usually occupied by vessels discharging or receiving their cargoes or lying at anchor and waiting for that purpose. This definition necesssarily excludes the waters adjacent to Sandy Hook from the limits of the port.

Chauncey M. Depew professes to believe that the prospects for railroad building are not good. The compulsory schedule made by the Iowa Commission "will not allow the railroads to make a penny." Besides, the proposition to reduce the tariff on steel rails, he says, causes railroad constructionists to delay work, in the expectation of buying materials cheaper than now. Even cheaper iron, in his view, would not accelerate railroad building, because railroads are useless unless there is business for them.

Iron bridges are being removed on the Pennsylvania Railroad, on account of their being too light for the heavy locomotives now employed and because stone bridges are considered more durable and more substantial.

R. M. Hunt, of New York, was re-elected president of the American Institute of Architects.

The preliminary statements of exports from the United States during September show that our wheat exports for the last nine months are less than half as great as for the corresponding months of 1887; our flour exports for 1888 fall little behind those of 1887, however, and largely exceed those of 1886. Our corn exports for the nine months fall behind those of 1887 by more than 6,000,000 bushels; but for the last three months they have exceeded in aggregate the corn exports of the same three months of 1887 by nearly 4,000,000 bushels. The comparisons of values of three items of breadstuffs exports for September are as follows:

	1888.	1887.
Wheat	$5,318,835	$4,701,860
Flour	4,405,652	5,351,812
Corn	1,824,228	926,628

The quantities compare as follows:

	1888.	1887.
Wheat, bushels	5,801,321	5,318,830
Flour, barrels	939,564	1,172,347
Corn, bushels	3,455,970	1,873,721

Last year the preliminary export statements for September were increased by $18,200,000 by the final and complete returns. If the same increase is to be relied upon this year, the aggregate September reports will be shown to have been $50,400,000. The imports for September, 1887, were $56,009,735.

The exports from San Francisco to Australia for the past three months exceeded in value $500,000, and the year promises to be the best in that trade California has ever had. The exports as above consist principally of lumber, doors, canned goods, salmon, broom corn and machinery.

The Venezuelan Government has entered into a contract for the introduction of French immigrants, apparently with the object of checking British encroachments.

The process of "electric sugar refining" is as great a mystery as that of the Keely motor. As long as it is conducted in "secret rooms" no outsider can form an intelligent opinon on the failure or success of its extraordinary claims.

The Lighthouse Board will ask Congress to prohibit the use of lights which are dangerous to navigation, the special reference being to those on the Brooklyn Bridge.

The Russian Government has under consideration a scheme designed to extend the oil trade in the Baku region, near the Caspian Sea. At present the oil has to be conveyed either by tank cars over the railway from Baku to Batoum and then transhipped, or by tank steamers through the Caspian and up the Volga, from a point on the latter river being conveyed to its destination by railway. The plan now contemplated is to connect the rivers Don and Dnieper by means of a canal, deepening at the same time the bed of the Volga. This would permit the tank steamers to pass all the way by water from the Caspian into the Black Sea, and thence, of course, to all parts of Europe, while by means of the rivers the interior of the Empire could also be reached. It is said there are no engineering difficulties in the way.

The Copper River country in Alaska has been carefully explored during the past season by parties who have just returned, and report the discovery of an abundance of good coal. At Four Rivers, according to the Juneau *Mining Record*, of September 20, "there are immense quantities of coal in this section exposed to view. The creeks in many places run in beds of solid coal, and in some places it is hard to find good anchorage on account of the bottom of the bay being nothing but coal."

R. J. McConnel, of the Canadian Geological Survey, has just returned from the Yukon River. The region, he says, is a vast gold and silver bed. Gold can be seen with the naked eye in ledges along the banks of the stream. On the Alaskan side they have erected works where 190 heads of stamps are in operation. The gold yields $30 to the ton.

Extensive new iron works are contemplated at Cairo, Ill., and Paducah, Ky. A Pittsburgh paper says Capt. S. S. Brown, of that city, has purchased a large tract at Cairo, with this object. One of the parties interested said: "Cairo is one of the best distributing centers on the continent to-day. Aside from the navigable waterways, there are the great railroad facilities. The city is 286 miles from Chicago, and therefore convenient to the great iron ore mines of Lake Superior. It is 200 miles from St. Louis, and a central point between the prosperous East and the growing West. Aside from the Lake Superior ores, there are the Tennessee ores, slightly inferior in quality, but still good, and at High Tower, near the city, as fine limestone as can be found in the United States is to be had in large quantities. I understand that one of the most extensive iron manufacturing firms in St. Louis has decided to locate large works at Paducah, Ky."

The test suits of John W. S. Earnshaw and Naylor & Company against Collector Cadwalader, of Philadelphia, to recover alleged excess of duty on importations of iron ore, resulted in a verdict for the defendant in the United States Circuit Court. If the complainants had gained their point a precedent would have been established, under which the Government would have been required to refund large sums of money as excess of import duties to various importers of iron ore. The question in dispute was whether, under the Tariff act of 1883, which assesses a duty of 75 cents per ton on iron ore, the Collector could not be be compelled to make an allowance of about 10 per cent. for the moisture contained in the article. The verdict practically determines that no allowance for moisture should be made. The suits attracted widespread attention, and arrayed the producers of the domestic article against the importers of African and Spanish iron ore.

The Brotherhood of Locomotive Engineers, in session in Richmond, Va., on Saturday re-elected the following officers: Third Grand Engineer, J. R. Sprague, of Toronto, Canada; First Grand Assistant-Engineer, H. C. Hayes, of Cleveland, and Second Grand Assistant-Engineer, A. M. Cavener, of San Francisco. Executive Committee, Edward Kent, of Jersey City; R. M. Clark, Denver, Col.; Edward Tinsley, Hamilton, Ont.; Wm. Johnson, Rock Island, Ill., and J F. Regard, Atlanta, Ga. A resolution was adopted indorsing the action of Chief Arthur in all matters pertaining to the Brotherhood since the last session. This virtually sustains Chief Arthur's action in the "Q" strike. The next convention will be held in Denver, Col.

Railroad officials have inspected the terminals on Staten Island in anticipation of the opening of Arthur Kills bridge, which is now nearly completed.

Another big telescope, dwarfing the instrument in Lick Observatory, is proposed by the University of Southern California. Perhaps in co-operation with Harvard University, a glass will be made 42 inches in diameter, as compared with 34 inches, the size of the Lick glass, and the effect will be to bring the moon within 60 miles of the earth, as it would appear if viewed by the naked eye. Mr. Clark estimates the cost of the glass and the mounting at $100,000.

The assassination of two paymasters near Wilkesbarre, Pa., in order to obtain the money they carried, raises the question whether it may not be necessary to adopt some other system of payment than that heretofore followed in the mining regions for the payment of miners and railroad laborers. Many thousands of dollars are sent from the banks weekly to coal-mining centers, and from there distributed by paymasters to various little settlements in the mountains. The men charged with this duty often have to drive for miles over wild and sparsely settled regions; their mission is well known, as also the time of their coming and the fact that they have large sums with them in small notes, that cannot readily be traced or identified.

The Manhattan Elevated Railroad Company have paid into the City Treasury $275,000 taxes for 1887. The road sought to avoid the payment of taxes on $19,000,000 of stock. The matter went into the courts, and the Corporation Counsel declared that the untaxable bond scheme was only a ruse, and carried the case into the Supreme Court, General Term, which promptly dissolved the injunction which the road had obtained.

It is affirmed that the electrical subway in this city is seriously injured by leaks in the pipes of the Steam Heating Company. The fault in the pipes, President Andrews says, is due to the use of wooden instead of cast-iron wedges. Since its completion the company, he said, had spent over $250,000 for repairs, and he thought further leaks were not likely to occur.

Notwithstanding her mishaps, the new steamship City of New York promises to attain extraordinary speed. As compared with the third trips of the other swift ocean steamships, the City of New York's third trip stands at the head. Following is a record of the time made by the Etruria and Umbria in the first three trips, as compared with those of the City of New York:

	Etruria.	Umbria.	City of New York.
	D. H. M.	D. H. M.	D. H. M.
First	7 18 05	7 16 25	7 11 39
Second	7 2 08	8 14 12	8 12 58
Third	6 22 33	6 23 25	6 15 37

Refugees from Jacksonville were prohibited by a resolution of the Board of Health, passed 19th inst., from returning to the city until officially informed that it is no longer hazardous to do so. They promise never again to "take to the woods" to escape yellow fever.

MANUFACTURING.

Iron and Steel.

M. V. Smith, of Pittsburgh, has closed a contract with the Virginia Iron and Nail Works Company, of Lynchburg, Va., for the erection of a regenerative gas furnace, with a 22-foot working hearth. The furnace will have a capacity for melting 45 tons of steel every 24 hours.

McClure & Schuler, the well-known engineers and contractors, of Pittsburgh, have received the contract for the erection of the new blast furnace of the Carrie Furnace Company, to be erected at Rankin Station, on the Baltimore and Ohio Railroad. The furnace will be erected adjacent to the present blast furnace of the Carrie Furnace Company, and will have an 18-foot bosh, and will be 80 feet in hight. It will be equipped with four Massicks & Crook's hot-blast stoves, 19 feet 6 inches by 70 feet. Riter & Conley, of Pittsburgh, have received the contract for the ironwork for these stoves, while McClure & Schuler will erect everything else pertaining to the furnace. It will have a capacity of about 200 tons per day. Work will be commenced in a few days, and it is expected that the furnace will be ready for operation not later than April 1 next. McClure & Schuler have also closed a contract with the Thomas Furnace Company, of Niles, Ohio, for the equipment of the Thomas Furnace with three Massicks & Crook's hot-blast stoves, work on which will be commenced in a few days.

The Union Steel Company, of Chicago, shut down their steel works and rail mill on the 16th inst. for lack of orders. They will probably remain idle until the close of the year, unless some of their customers should desire a round lot of rails on quick delivery, which would make it worth their while to light up. These works have made a very satisfactory run since they were started up in the spring, their output of steel and rails having been very large for the time they were in operation. The blast furnaces owned by the company will be kept at work making pig iron, which will be piled up to await the resumption of the steel works.

The Chicago Forge and Bolt Company were the successful bidders for the contract for the superstructure of the Western avenue viaduct, Chicago, which was let last week. Their bid was $17,800.

The Standard Iron Company of Bridgeport, Ohio, have just completed an addition to their plant, which in part consists of a three-high train for rolling steel and iron sheets and plates, from No. 14 to ¼-inch in thickness, and not exceeding 50 inches in width. This train is equipped with all modern appliances, insuring economical handling of product and satisfactory execution of orders. Fearing delays in getting this part of their extension into operation, the company have not heretofore offered their product, and are now consequently able to quote prices for prompt shipment.

The National Tubular Axle Company, of McKeesport, Pa., have commenced the erection of a large stockhouse, the foundation being already completed. When this addition is completed the works will be enabled to stock up in slack times, and be prepared for supplying larger orders on shorter notice.

From a recent issue of the Youngstown (Ohio) *Herald* we take the following: "Andrews Bros. bought the site of the Niles Company's mill this week for $3500. It consists of about 17 acres, was formerly owned by the Harris Blackford Company, and then the Niles Iron Company. The old mill was moved to Hazelton, and it is now predicted that Andrews Bros. will put up a new bar and sheet mill. It is a surprise to many that the plant was sold, as the Niles Iron Company were not at all embarrassed and the property was worth much more money than it was sold for."

It is reported on good authority that the Millvale Rolling Mill of Graff, Bennett & Co., at Pittsburgh, which has been idle since the failure of that firm some months ago, will be started up about November 1 next by the same syndicate of creditors that is now operating the Clinton Rolling Mill and Blast Furnace. It is probable that only the puddling department of the mill will be put in operation at the start, to be followed later on by the resumption of the entire plant.

The Mahoning Gas Fuel Company has withdrawn its supply of gas from the mills of Brown, Bonnell & Co., at Youngstown, Ohio, on account of the refusal of the firm to change their furnaces so as to adapt them especially to the use of gas. When gas was introduced in the mill as a fuel the furnaces, formerly using coal, were not changed, and the gas company claim that enormous quantities of gas have been thereby wasted. It is said that more gas is wasted in the Mahoning Valley than in any other industrial section in the country in which gas is used.

The Fort Pitt Foundry, of D. W. C. Carroll & Co., Limited, at Pittsburgh, who made an assignment some months ago, will be auctioned off at an assignee's sale, on Tuesday, the 30th inst., to satisfy a mortgage for $34,000, placed October 1, 1887, with interest in arrears. A tract of land in Braddock Township will also be sold at auction. On it are mortgages, one for $6000, placed November 8, 1887, and another for $5385.50, placed November 22, 1887, both with the accruing interest. W. R. Errett is the assignee, and James W. Drape the auctioneer.

The well-known firm of W. D. Wood & Co., Limited, of Pittsburgh, whose plant is located at McKeesport, Pa., have given notice of an application to the Governor for a charter for a corporation to be known as the W. Dewees Wood Company. The capitalization of the new company will be $1,000,000, and the charter is to give the firm more privileges than under the present manner of conducting their business. At present no enlargement of the works is contemplated.

Carnegie, Phipps & Co., Limited, of the Homestead Steel Works, at Homestead, Pa., are engaged on rolling some extremely heavy armor plate for the Ordnance Department. These plates are 141 inches long, 112 inches wide, 2 inches thick, and weigh over 10,000 pounds each, with 80,000 pounds tensile strength.

The Woodstock Iron Company are excavating for the erection of large ore roasters, at their two new coke furnaces at Anniston, Ala.

P. L. Kimberley & Co., Limited, proprietors of the Atlantic Iron Works, at Sharon, Pa., and the Greenville Rolling Mills, at Greenville, Pa., have opened an office in St. Louis, Mo., with Louis McGilvray in charge. The firm's increasing trade in that section of the United States necessitated the new branch.

In the Pittsburgh papers, recently, was published a statement that Laughlin & Co., proprietors of the Eliza furnaces, in that city, had commenced the erection of a new blast furnace. We find, upon investigation, that the rumor is not well founded. It probably originated from the fact that one of the old furnaces will be blown out in a short time, and will then be torn down and rebuilt to a 200-ton furnace, which is about double the present output. The two old furnaces now in blast have been producing on the present lining since 1882 without interruption, each furnace casting about 100 tons per day.

In a few days work will be commenced on a large addition to the works of J. P. Witherow, the well-known engineer and contractor, of Pittsburgh, which are located at New Castle, Pa. The addition, which is to be of brick and stone, will be 91 x 136 feet, with a tower 81 feet high, in which there will be offices on each of the three floors. The addition will give the machine shop almost double its present capacity.

Claire Furnace, owned and operated by the Claire Furnace Company, Limited, at Sharpsville, Pa., have been doing some good work recently. For the week ending on the 14th inst. the product was 896 tons of Bessemer iron. The best day's work during the week was 147 tons. This is the largest amount of iron ever made by any blast furnace in Sharpsville in 24 hours.

The plant of the Union Steel Nail Company, located at Omaha, Neb., is about to be removed to St. Joseph, Mo. Upon its removal it will be greatly enlarged and modernized, the present plant being but a nucleus. The style of the corporation, in order to transact business under the State laws of Missouri, will be the Union Steel and Iron Company. The following are officers of the new company: Wm. Haven, president; George T. Walker, vice-president, and W. N. McCandlish, secretary and treasurer.

The report that the Bellaire Nail Works, of Bellaire, Ohio, was making steel from metal direct from the furnace is without foundation. What gave rise to the report was the fact that the company recently made one heat from metal direct from the blast furnace. As to what may be done in this direction in the future, James Wilson, president of the company, expresses his views as follows: "Whatever we may do in using metal direct from the furnace hereafter, we are making no arrangements at present in that direction. We are very fully aware of the difficulties to be met and overcome in making the grade of steel we aim to make by the direct process, but think it possible that blast furnace practice may be ultimately so uniform as to product that the principal difficulty in using the direct process will be overcome."

The Muncie Nail Company have been organized and chartered at Muncie, Ind., with a capital stock of $200,000, to succeed the Greencastle Iron and Nail Company, of Greencastle, Ind., and under the same management, with the following-named directors: J. F. Darnell, F. P. Nelson, Wm. H. Durham, Jas. V. Durham, and R. B. F. Pierce. The product for the present will be steel and iron nails and muck bar. The buildings for the Muncie Nail Company are completed and the work of moving the plant from Greencastle to Muncie is progressing rapidly. When fully equipped the new plant at Muncie, in point of convenience and arrangement, will be equal to the best nail mill in the country. Natural gas will afford all the fuel and light, the gas being located on the grounds of the company and controlled by them.

The Mayville furnace, at Mayville, Wis., was blown in on the 13th by H. S. Fleming, who reports that the blast was put on on the 14th, and on the 15th a cast of No. 3 iron was made. On the 17th the furnace was making two-thirds of its capacity.

The Mason ingot manipulator, which was described in *The Iron Age* of recent date, continues to do good work in the

steel plant of the Bellaire Nail Works, at Bellaire, Ohio, where it has been in successful operation for some time. For the month of September just closed the production of the steel plant was the largest in its history. The largest output in one day previous to the introduction of the manipulator was 207 tons, while the largest daily production since the introduction of the same has been 222 tons. The largest weekly run without the manipulator was 1927 tons, but since its adoption the output in one week in September reached 2003 tons. This work was performed with three men less to the turn than were emp'oyed before the manipulator was used.

Hon. John H. Bailey, assignee of the firm of Graff, Bennett & Co., has filed a petition in Common Pleas Court No. 2, at Pittsburgh, asking for permission to sell the remainder of the firm's assets to a syndicate of the firm's creditors, whose claims aggregate $450,000. The property of the firm still in the hands of the assignee consists of several small pieces of real estate scattered throughout the country, a large number of uncollected accounts and interests in other firms, some of which are uncertain and indefinite, and others of which are in litigation. The syndicate, which is represented by James M. Bailey, James Pickands and James W. Friend, offer to pay $50,000 for these assets, this sum to be deducted from the dividends due the creditors who form the syndicate. The assignee believes that the offer is a reasonable one, and, as it would wind up the affairs of Graff, Bennett & Co. in short order, recommends that it be accepted. A hearing on the petition will be held on November 3 next.

Machinery.

The Cleveland City Forge and Iron Company completed last week the last piece of the ponderous machinery built by them for the Puritan. It is the connecting-rod, weighing, when finished, about 21 tons. It is 40 feet long, and finishes 18 feet 6 inches diameter in the middle. Constant improvements are being made at these works. For the turnbuckle department a new brick and iron building has been erected 330 feet long by 65 feet wide. There will be four large forging machines at work in this shop. A new one is being erected that will exert a force of 6000 pounds at the point of impact. The capacity of the mill will be about 2000 turnbuckles a day. In this department is manufactured the Chapman jack, a machine which is meeting with great favor and large sales. Next year the Forge Company propose to rebuild their entire main shop with brick and iron, a very wise conclusion, as their plant is entirely too valuable to run the risk of damage by the burning of the wooden sheds now inclosing it.—*Trade Review.*

The Lewis Foundry and Machine Company, Limited, of Pittsburgh, have received an order from the American Wire Nail Company, of Covington, Ky., for the erection of a Garrett rod mill on the Anderson, Ind., gas belt. The works will cost in the neighborhood of $200,000, and when completed will give employment to over 200 men

The Westinghouse Electric Company announce their lease of the Consolidated Electric Light Company, of New York City, and the Sawyer-Man Electric Company, also of New York City. The Westinghouse Electric Company have had heretofore a working arrangement with these companies, by which they were able to avail themselves of the protection of the Sawyer-Man lamp patents, and to profit by the peculiarities in the manufacture of lamps covered by these patents, which had originally placed the Sawyer-Man lamp in the fore-front of the business for life, efficiency and freedom from blackening, and the adoption of which processes, in connection with what are known as the Lodyguine processes, has so greatly improved the lamps now manufactured by the Westinghouse Electric Company. This lease gives the Westinghouse Electric Company entire control of these two companies. The two factories which the Westinghouse Electric Company now control under this lease—namely, the one at their works in Pittsburgh and the one on West Twenty-third street, New York City—have a joint capacity at present of 10,000 lamps per day.

Lodge, Davis & Co., Cincinnati, Ohio, report sales of from five to thirty duplicates of the various machine tools exhibited at the Centennial Exposition since the opening. Their new manufacturing plant is now complete and in full operation. The new plant is one of the largest machine tool manufacturing establishments located in the West, occuping an entire square, a portion of the building being three stories in height, while the balance is two stories.

The St. Joseph Pump Company, St. Joseph, Mo., are introducing with gratifying success to the trade the Perfection Water Elevator and Purifier, for which the company claim many points of superiority over similar constructions, chief of which is the flat-link connection used in their elevators. The cup being permanently fastened to the wire link obviates the necessity of removing it in order to lengthen or shorten the chain, as is done with all other makes. The company enjoy ample facilities for the production of their goods, consisting of a new factory building three stories high, 50x120, with a two-story addition, 75 x 50, warehouse building, 50 x 100, three stories; galvanizing and varnishing building, dry-house, &c., located just south of the city limits.

The Auburn Mfg. Company, of Auburn, N. Y., have just added to their extensive works a steam plant, to be used as auxiliary power in seasons of low water in the Owasco River. The engines consist of one pair right and left compound condensing single crank automatic cut-off of 150 horse-power each, and were manufactured by Messrs. McIntosh, Seymour & Co.

Hardware.

The nail and wire mills of the Hartman Steel Company, Limited, at Beaver Falls, Pa., are closed down at present, on account of an insufficient supply of natural gas. The Bridgewater Gas Company have the contract to supply the works with gas, but for some time past the supply of gas has not been sufficient to operate the works. This shortage will be remedied as soon as a line can be laid from the Bakerstown field, work on which is now being actively pushed.

The New Castle Wire Nail Company, of New Castle, Pa., are increasing their capacity considerably by the erection of some new machinery.

The Covert Mfg. Co., West Troy, N. Y., report an unusual demand for their full lines of specialties, obliging them to run their works to their full capacity, the month of September having been especially active. They also allude to the fact that many of the leading jobbers are now preparing their catalogues for publication, and state that the demand thus made for electrotypes illustrating the Covert goods has been greater this season than ever before.

The Bellaire Stamping Company, of Bellaire, Ohio, under date of the 9th inst., write us as follows: "Since the beginning of the current year this company has more than doubled its manufacturing capacity. The first step toward making the increase was the purchase of the plant of the Buckeye Lantern Company, of this city. This included their letters patent, stock of lanterns, machinery, and factory building. The latter is a large, substantial brick building, built by the State for a tobacco warehouse and now used by us partly for manufacturing purposes and partly as a warehouse. We have just completed a new three-story brick building in connection with our main building, and are now changing a two-story frame building 40 x 100 feet into a corrugated iron building. The entire plant, then, consists of two brick and one iron factory buildings and one brick warehouse, all of which are considered fire-proof. The buildings are heated by the Sturtevant hot-air system and are fitted up with the most modern appliances."

Miscellaneous.

The American Leather Link Belt Company report recent sales of their leather link belting to the following firms: J. H. Horne & Sons Company, Lawrence, Mass.; Angle Lumber Company, Houston, Tex.; P. Lorillard & Co., Jersey City, N. J. Economic Gas Engine Company, 34 Dey street, New York; Remington Paper Company, Watertown, N. Y.; Heidenheimer Bros., Galveston, Tex.; Travers Bros., 556 West Fifty-second Street, New York; Philadelphia Rubber Works, Philadelphia, Pa.

The Illinois Alloy Company, 41 and 42 Portland Block, Chicago, have issued a circular showing the result of a comparative test of their best brand of bearing metal and that of four other makers by the Ohio State University on the 11th inst. The journal was kept well lubricated and the total pressure was 2000 pounds. With sperm oil the average friction shown by their metal was 0.0582, against 0.075, the lowest of the other four; the minimum friction was 0.034, against 0.0485, the lowest of the other four. With mineral oil the average friction was 0.0436, against 0.0686, the lowest of the other four; the minimum friction was 0.0305, against 0.0465, the lowest of the other four. With lard oil the average friction was 0.0517, against 0.0554, the next lowest; the minimum friction was 0.0375, against 0.0455, the next lowest.

A charter has been issued to the Pittsburgh Iron Company, of Pittsburgh, capital $10,000. The directors are Charles Hood, Joseph Vogel, Sr., E. L. Clark and John Bunnette, of Pittsburgh, and Joseph Robbins, Westmoreland County.

The sheet and rod mills of the Tamarack-Osceola Copper Mfg. Company are being driven with orders, as there is a large amount of work to be turned out and shipped before the season of navigation closes; 25,000 pounds of bars were turned out last Monday. A 15-lamp dynamo is being placed in the mill, to be driven by the 12 x 12 blower engine. The new wire mill is covered in, and the foundation for the engine, which is to be a compound Wheelock, is being put in. Work on the smelting buildings is being pushed rapidly forward, one of the buildings being almost completed.

Kingman & Co., Peoria, Ill., announce under date October 4 that they were awarded the first premium for the largest and finest display of farming machinery at the St. Louis Fair, October 2, 1888, and allude to the extent of the exposition of agricultural machinery and products as giving value to the compliment bestowed upon them. They also state that they are busily at work rebuilding their Peoria warehouse, which was burned August 14, and state that they will add another story, giving them seven floors. They are also building the Peoria Cordage Company's factory, and expect both to be under a roof by December 1.

The Iron Age

New York, Thursday, October 25, 1888.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The Percentage Fiend.

In our recent articles dealing in a general way with the question of protection, we have sought not so much to follow the well-worn lines of argument on the subject as to point out features of it which have been largely overlooked on both sides. It is in that spirit that we now desire to call attention to the performances in this field of one of the pests of logic, the percentage fiend. Nothing is more fashionable among amateur statisticians than the expression of all results in percentages. It gives such an air of scientific generalization and irresistible conclusion, and so few people will take the trouble to analyze the process by which the imposing result is reached, that the temptation to adorn the flimsiest structures of statistical inference with this fine architectural cornice is well-nigh irresistible to the Buddensieks of sociology, politics and finance.

When the greenback dollar was worth but fifty cents in gold, the percentage fiend declared that the depreciation amounted to 200 per cent. And we notice something of the same quality in many of the percentage calculations now current on the tariff question. Apart from such crass arithmetical blunders, however, there are more serious and subtle errors attending the use of percentages in talking about the tariff. One of these has been often exposed, but continues to be asserted by one party and not infrequently permitted to pass without denial by the other. We refer to the current statement that the Mills bill reduces the average duty from about 49 per cent. to about 42, or only about 7 per cent., and is, therefore, nothing so very terrible after all. We have heard these figures slightly varied, but this seems to be the "average" statement. It is incorrect and misleading from every point of view. In estimating the average reduction it excludes all the articles put on the free list; or, to speak with the tongue of the fiend, it arrives at the average percentage by omitting all items of 100 per cent. Moreover, a reduction from 40 to 42 per cent. is a reduction of over 14 per cent. And, finally, the whole method of estimating the "average" duty in this way is utterly worthless as a measure of the amount of protection accorded by the tariff—so utterly worthless that the man who discusses the tariff in terms of percentage only goes far to demonstrate his entire ignorance of the alphabet of the subject.

The percentage of a single duty is not the measure of its value to the manufacturer, or even of its alleged burden upon the consumer. And the average percentage of duties throughout the whole list of dutiable goods means still less. There are two ways of calculating it, one of which is as meaningless as the other. The duties themselves may be averaged, giving each item in the law an equal value, without reference to the quantities imported; or the total valuation of imports may be compared with the total Custom-House receipts. It is evident that by either method a thousand different tariffs might yield the same result, and that by the second method (which we presume to be that of the "average" percentage fiend of to-day) the same tariff will yield a different result every year. The final *non sequitur* is reached when, for the purpose of such a calculation, specific duties are transferred into percentages, so that as protection and progress cheapen goods year by year the "extortions" of the tariff are made to appear bigger and bigger Thus American railroads were but slightly burdened when steel rails sold at $165 per ton, and are crushed to earth with rails at $30 or less!

There is another exercise in which the percentage fiend delights. "In such-and-such a year," he cries, "such-and-such a trade thought so-and-so-many per cent. a sufficient protection. We have given them that much in the Mills bill, and they pretend it will ruin them. What impudent and self-evident lying!" We do not expect to reclaim the fiend. In fact, we have called him a fiend to signify that he is beyond reclamation. But innocent people, puzzled if not tempted by his demoniac suggestions, may profit by the following reflections: Assuming that the American manufacturer of any article needs and ought to have any protection at all, and is not necessarily a thief and robber if he asks for it, what he needs is not so much a percentage as a certain definite sum to cover his extra costs. His protection consists of this sum, plus the freights of his foreign competitors. An ad valorem duty is not as good, either for the manufacturer or for the public, as a specific one. The duty which helps to protect him does not protect simply in the proportion of its percentage. The cheapening of his product by competition and scientific improvements does not necessarily reduce his need of protection in the same proportion. And the reduction of ocean freights may deprive him of so great a part of that protection as to render his request for a higher percentage of duty (or even for an absolutely higher specific duty) entirely reasonable. In other words, the fiend's proposition is not self-evident at all.

The subject of the reduction of cost in international transportation is one that has not been sufficiently considered by tariff disputants. And it is part of a larger subject—namely, the total revolution in the business methods of the civilized world during the last two decades, in accordance with which political economy has got to be reconstructed also. It will still be open, to any one who chooses to advocate entire free trade; but it must not be supposed that even free trade will operate as it would have done 20 years ago, when the protective barriers of nature—distance and the sea—still exerted a formidable influence. This tariff of nature has been almost removed by the progress of science, and, in the face of this reduction of duty, prating about percentages is both superficial and superfluous.

Finally, if a certain duty, however expressed, is necessary to maintain the existence of a given industry, there is no sense in the proposition that its reduction by a given percentage, whether 7 or 14 or any other amount per cent., is moderate and liberal treatment and not "free trade." Less than enough is practically nothing. We do not now propose to discuss the question whether the reduction of duty proposed in the Mills bill would, in fact, destroy any American industry. What we desire to emphasize is the fact that the proposal is made in ignorance of its effect; that no adequate inquiry into the matter preceded the framing of the bill, and that its reported authors and avowed advocates before the public fully betray and confess this fact when they adopt as their only argument the lingo of the percentage fiend.

Hamburg in the German Customs Union.

The merchants of the hitherto free Hanseatic cities, Hamburg and Bremen, are the most enterprising, and, financially, most powerful, in Germany. They are, at the same time, the largest shipowners; their trade extends to the remotest corners of the habitable globe, and, with the United States—New York in particular—they have at all times transacted an enormous amount of business. Hardly a day passes but one of their large steamers enters or leaves our harbor. A radical change in their commercial and industrial condition is, consequently, a matter of no small interest to ourselves. They were large free ports, and prided themselves upon being the last remnants of the famous Hanse League of commercial cities, founded in the year 1239.

Steam, the telegraph, and, finally, the restoration of the German Empire, have, however, wrought such changes that both ports enter the Customs Union without regret—nay, with a confident hope of bettering themselves. The fact is that large free ports are at a discount, since there is no longer any necessity for the accumulation in bond of large amounts of staple products at leading ports, steam, the telegraph and the Suez Canal facilitating the rapid procurement of such goods, and, furthermore, enabling large inland cities to do an extensive direct trade with Transatlantic countries, the goods passing through the ports merely in transit. Trieste was the first free port declaring its readiness to abandon what was till then deemed an enviable privilege. At the time of the restoration of the German empire, in 1871, two of the four free cities in Germany had already lost their freedom, one forcibly—Frankfort-on-the-Main in 1866—and Lubeck voluntarily soon after. Upon the creation of the new empire Hamburg had stipulated that her old rights of a free port should be maintained, and a guarantee to that effect had been given in Article 34 of the constitution of the empire. But it had been found that from the time Frankfort became an integral part of Prussia its prosperity increased more than ever. This the Hamburg people knew, and gradually a majority of them decided to enter the Customs Union, especially since it was feared that if they hesitated all the German commerce would pass via Altona and

Gluckstadt. In 1881 the city, therefore, petitioned for admission into the Customs Union, and a convention was drawn up fixing the conditions of such admission. The right of Hamburg as a free port is not entirely surrendered by this convention, but the free entry is limited to a quarter on the left bank of the Elbe, in which quarter, however, nobody is permitted to reside, nor are there to be any bridges connecting it with other parts of the town. In order to simplify the customs regulations a canal had to be dug along the left side of the river, toward the expenses of which the Federal government contributed 40,000,000 marks. Besides, Hamburg's demand was granted that ships should be permitted as heretofore to pass from the sea into the free port without customs inspection, and that the supervision between the free-port part of the town and the Customs-Union territory should be intrusted to Hamburg officials.

Hamburg will gain more advantage from the annually growing seaport trade of Germany than it had from its own manufacturers and maritime trade in foreign products. Besides, even this trade will increase and not diminish, and with the powerful assistance of the German Empire it will have nothing to fear from other ports, like Antwerp, for instance, which otherwise might have become an extremely dangerous competitor. The measure of incorporation was passed by the German Parliament in 1882, and became operative on the 17th inst.

Old Hamburg has ceased to exist, and a new state of things has been established and inaugurated by the abolishment of the separate excise duties of the town, which have a very interesting history of their own, and which still found many defenders during the last few years; but the citizens of Hamburg, when they once had decided to enter the Customs Union, wanted to abolish even the last remnants of their mediæval commercial legislation and make a clean sweep. The little houses on the turnstiles have been demolished, and magnificent edifices of the Federal Customs Administration have been erected where the free port district borders on the protective territory. On December 1, 1885, the population at Hamburg was 518,620; in 1886, its import of merchandise amounted to 2,080,700,000 marks, and of specie and bullion to 49,600,000; the merchandise received from the United States, direct, was 111,600,000 marks. Bremen will follow suit and be merged as soon as all the new custom-houses there shall have been finished, together with the new harbor works.

Cheap Passenger Tickets.

Some of our progressive merchants in different lines of trade have been discussing among themselves the feasibility of certain improvements in transportation, and during the early winter something may be done publicly toward asking the attention of railway managers. One of these things is an extension of the excursion or round-trip plan in tickets. It is well known that the old traditions of the Trunk lines were all against any reduction from the one rate of fare. The argument was that the buying of a round-trip half-fare ticket meant merely so much loss, since the regular full fare would otherwise be paid, but this is clearly erroneous. As a matter of fact the cheap traveler and the first-class passenger can scarcely be classed together, and are not really competitive. One man wants luxurious vestibuled cars with all the modern appliances of speed, dining cars and the like, and is willing to pay for them. Another country merchant, obliged to look closely after his dollars, is tempted into a journey to his headquarters by a reduction of fare, even if limited to slower trains. The astute railroad manager accordingly arranges his fares and time-tables to secure both kinds of travelers. This is the highest wisdom, for, granted that the trains must run, any plan which will fill them full instead of half-full will add to the earnings and little or nothing to the expense. It is important that the cheap tickets should not be used by the well-to-do first-class passengers, and many are the devices to secure this end. The English plan is by different coaches on each train at different rates of fare, but this is cumbersome, since it requires the hauling of many more cars than is necessary to accommodate the people. To confine cheaper travel to special trains is tried in the United States by means of "limited" trains, or, in the the case of workingmen's trains, at special hours.

In freight matters the American railways lead the world in cheapness, and this has been accompanied by such an increase in tonnage that net revenue is not diminished. This has been brought about in a measure by the principle of fitting the rate to the necessities of the shipment, so that traffic which could only be moved at lowest rates was carried, and with it other shipments at double the charges, each according to its commercial ability to pay the carrier. If it were possible to apply this same principle thoroughly to passenger travel we would solve the problem. If we could judge whether a journey were worth $5, or $20, or $1, to a passenger, and could sell him a ticket accordingly, we could double the present number of trains at increased revenue for the railroads, and at the same time give all merchants a chance to come into town on frequent trips in search of purchases or novelties. It is in human nature to settle into ruts, and we all need the stimulus of other minds and of other sights than our usual ones to make us put forth our best exertions. A general storekeeper who rarely leaves his native village soon loses his ambition. So it is that the city manufacturer or jobber who wishes to see the reward of his thought and enterprise in larger sales must at the outset find customers who appreciate this effort, and this in turn demands a certain amount of culture which is not so often found in retailers who never leave home. Hence, it follows that the manufacturer or jobber has a direct interest in giving his support to any movement among his fellow tradesmen or among the railroad men to bring to his city such retail merchants as do not now travel, but who might do so under a reduced rate of fare.

It is but fair to concede to the railroads such restrictions upon cheap tickets as will generally restrain their sale to the class for which they are designed, and yet there is no doubt that less progress has been made in this direction than in any other department of railroading. We need a more thorough study of the passenger problem, with more liberal views as to the effect and the necessity of half-fare round-trip tickets. If this could be secured all would be gainers—the railroads, in trains well filled; the city merchants, in more frequent visits from country customers, and their consequent more rapid sales of novelties and improved articles; the neighboring tradesmen, in opportunities for keeping a better run of things and for personal inspection of city stocks. Intercourse is the great means whereby we all advance in civilization equally, and cheap tickets for those who cannot buy dearer ones would greatly promote it. The merchants can suggest, but the practical steps must be taken by the railroads. If, as hinted, some public requests be made by merchants in different cities during the winter, asking that the matter be given closer attention by our railroad superintendents and passenger managers, then we may hope for a practical advance in this direction.

Settling a Strike.

An important chapter in strike literature has just been contributed in Chicago. The development of the trouble leading to the strike and the subsequent attitude of the contending parties in interest were of an unhappily common character; but the way in which the matter was finally settled was altogether unique and worthy of being taken into consideration in other localities. A demand for a rearrangement of working hours and an increase in wages had been made by the employees of an important street railway company, which was conceded by the managers as to the first point, but refused as to the second, whereupon all hands struck. For the purpose of embarrassing the management, a strike was also precipitated on another extensive street railway system in which they were interested, although the employees of that system had no grievance of their own. A third line, having no connection whatever with the first two, was also tied up, merely because it ran through part of their territory. Altogether a good two-thirds of the street railway service of Chicago was involved, to the great discomfort, inconvenience and even pecuniary loss of a large part of the city's population. This condition of affairs lasted for a week, an attempt being made in the meantime by the railway managers to secure new men to run their cars, which was opposed in every way by the old force of hands and their sympathizers, requiring the constant efforts of the entire police force of the city to prevent rioting and consequent damage to property, as well as loss of life.

During the continuance of the strike unceasing efforts were made by the city authorities and prominent citizens to bring the contending parties together and effect a basis of settlement, but their well-meant attempts at mediation were unsuccessful until the citizens generally held indignation meetings protesting against the stubborn attitude of the belligerants and insisting upon the adoption of a compromise. The daily press also took the same position, and a powerful expression of public opinion was thus evoked which had its influence. Committees were appointed by the striking men to meet the railway managers and Mayor Roche in consultation, and those who were striking in sym-

pathy were ordered back to their posts again to await the result of this supreme effort to settle the trouble. Professional labor agitators, who had made themselves conspicuous in directing the councils of the strikers, but were not railway employees in any capacity, were excluded from the deliberations.

Then came the critical point, when the most careful management was needed to bring the hostile parties upon a common ground of mutual concession and effective agreement. The conference was long and evoked much bitterness, but Mayor Roche steadily reminded both sides that, as the representative of the people, he was there to see the dispute finally settled, and that a compromise should be arranged. A beginning was made, but details were hotly disputed, new objections and difficulties arising as soon as old ones were disposed of, any one of which would probably have been a fatal bar to further progress toward a settlement if the chief magistrate of the city had not persistently appealed to the parties that they should not permit trivial matters to interpose and prevent an agreement. At length all questions at issue were adjusted and the strike was pronounced at an end. It would hardly be supposed that the result of negotiations carried on under such circumstances would be very satisfactory to either set of disputants. Both gave way further than they would have done without the pressure personally applied through the Mayor, but which they felt came from the citizens generally. The sores left may take some time to heal, and an occasional outcropping of bitterness may be manifested, but the condition of affairs is much better with a general resumption of business than would have been the case if the fight had continued several days longer and involved widespread interest. The loss in income to corporations, in earnings to workingmen, in sales to business men, might have reached enormous amounts, to say nothing of the inconvenience entailed on all classes of citizens and the inevitable accompaniment of injury to persons and damage to property.

This has been averted by the decisive action of Mayor Roche. The position he took as a compulsory arbitrator is worthy of imitation under similar circumstances in these days of frequent strikes and labor troubles. The warrant for such action does not necessarily rest in statute law, but comes from a higher authority—the welfare of the community. The questions at issue between employers and employed may seem to them to be of immense importance, but the interests of the people at large are paramount. Mayor Roche did well in making them an active third party in the settlement of the Chicago controversy.

OBITUARY.

FRANK M. REYNOLDS.

Frank M. Reynolds, superintendent of the United Coal and Coke Company, died recently at his residence in Connellsville, Pa., after a brief but severe illness, in the thirty-sixth year of his age. Mr. Reynolds has been identified in various responsible capacities with the interests of the Connellsville coke region for about 15 years, and was highly esteemed by all who were brought into contact with him.

Triple Power Hydraulic Shear Legs.

A short time ago Mr. G. Richou gave, in *Le Génie Civil*, an account of the triple power hydraulic shear legs erected at Marseilles, France. From an abstract of his article, just published in the "Excerpt Minutes of the Proceedings of the British Institution of Civil Engineers," we take the following:

The shear legs constructed for the port of Marseilles, by the Fives-Lille Company, and placed on the quay near the graving-docks, had to be designed to lift a load from a vessel alongside the quay and deposit it on a wagon or truck near the edge of the quay for its head to be able to advance 29½ feet beyond the edge of the quay, and to recede 16½ feet behind it, and its hight such that the load could be lifted over 23 feet above the quay level. It had to be made to work, at pleasure, at powers of 25, 75 and 120 tons, with a proportionate expenditure of water, and to be provided with a capstan for conveying the loaded truck directly beneath it and for removing them.

To illustrate the novel arrangements introduced in these shear legs, the author commences with references to some of the shear legs previously erected. The old type consisted of two shear legs fixed apart, one behind the other, at the bottom, but connected at the top, hanging over the quay to the requisite extent, and maintained in a fixed position by ties anchored in the masonry. The lifting was effected by pulleys fastened to the tops of the shear legs, and moved by hand winches or capstans, whilst other pulleys were required to draw the load on to the quay. These shear legs required a number of men, and their greatest power was 40 tons. The increased power required for handling the large guns of ironclads and marine boilers has led to the adoption of shear legs, similarly fixed, but worked by steam or hydraulic power, of which, among those made within the last 20 years, may be cited the shear legs erected at Toulon, Antwerp, Spezia and Elswick. The machine at Toulon, constructed in 1867, consists of a couple of fixed shear legs, connected at the top by a strong girder, on which the trolly runs which shifts the load. One steam winch lifts the load, and another shifts its position. The motive force is an engine of 30 horse-power, and the maximum power is 50 tons. The shears erected at Antwerp in 1878 has three legs, connected at the top by a steel axle; a hydraulic machine with three cylinders works alternately a winch carrying a cable for lifting and two endless screws, which move the bottom of the hinder leg, and, causing the two other legs to turn on two pivots fastened on the quay wall, shift the load horizontally. The working is simple, but the toothed gearing and endless screws produce considerable friction, and are not suited for accelerated working, which is sometimes necessary. The three-legged oscillating shears at the Elswick gun factory transports the load like the Antwerp shears, but the lifting is effected by the aid of a hydraulic cylinder suspended from the shears. The lifting is similarly effected by the shears at the Spezia arsenal, also erected by Sir W. G. Armstrong & Co., but the horizontal movement is produced by the rotation of the shears. Both these last-named shears can lift 160 tons.

The new shears at Marseilles are three-legged and oscillating, like those of Antwerp and Elswick, and with direct action, both for the lifting and the horizontal motion. The piston of a hydraulic press, acting upon the bottom of the hinder leg, effects the oscillating movement; and another hydraulic press, suspended from the top of the shears, accomplishes the lifting. An automatic multiplying apparatus causes the water pressure to be increased for lifting loads of between 75 and 120 tons, and to be reduced for loads of between 75 and 25 tons. An accumulator holds in readiness the greater portion of the water, under pressure, required for one operation. An apparatus, furnished with cables, erected on the back of the hinder leg of the shears, serves for accessory operations and for lifting loads not exceeding 8 tons. Lastly, a suspended platform, on which the conductor stands, enables supervision to be exercised close at hand over all the operations. The hydraulic cylinder for lifting, instead of being hung from the top, as at Elswick and Spezia, which is liable to cause leakages and thus impair the power of the machine, is suspended from its forged steel bottom by two steel rods, fastened to the top of the shears by a Cardan joint, relieving the cylinder from the strain of the load, and affording it the required mobility. The diameter of the cylinder is 1¾ feet, having been calculated for a mean power of 75 tons, with a water-pressure of 710 pounds per square inch. The automatic multiplier is used for powers of 25 and 120 tons, consisting of two cylinders, placed end to end and fastened together by rods, in which two pistons of different diameters work. Two of these machines, placed side by side and coupled, insure a continuous motion of the load when lifted. The water-pressure, which continues uniform, is directed against the larger or smaller piston, according as the water-pressure in the lifting cylinder is to be increased or diminished; for the larger piston, acting on the smaller piston, increases the pressure of the water delivered into the lifting cylinder in proportion to their diameters—namely, up to from 1280 to 1420 pounds on the square inch; while, when the smaller piston acts on the larger piston, the pressure is proportionately reduced. The diameter of the large piston is 1.1 foot; of the smaller piston, 10 inches, and of the connecting rod, 9½ inches, and the length of stroke is 3.28 feet. The maximum hight of lift, of 46 feet, can be accomplished, in case of need, in 28 seconds. The shear legs were tested, in August, 1887, with a load of 140 tons, and worked perfectly. The efficiency of this machine, with direct action, is much greater than where the power is transmitted by cables, and for loads of 75 to 80 tons, not requiring the intervention of the multiplier, is at least 90 per cent., instead of an efficiency of only 25 per cent. for the type of shears like those at Antwerp.

Corporations were recently organized in Illinois as follows: The Fox Solid Pressed Steel Company, at Chicago; capital, $500,000; incorporators, Charles S Holt, Colvin C. H. Fyffe, Arthur D. Wheeler. Chicago Carriage Lamp Company, at Chicago; capital, $15,000; incorporators, John H. Kaiser, Jr., Charles H. Engel and Fred L. Brooke. The Universal Heating Company, at Chicago; capital, $50,000; incorporators, Lewis K. Curlett, Henry Boyce, W. Knox Haynes. Sim Foundry Company, at Chicago; capital, $12,000; incorporators, Justin R. Graves, John C. Armstrong, Martin M. Gridley. National Implement Company, at Aurora; capital, $200,000; incorporators, W. H. Craddock, Frank D. Ray and William D. Goodnow. A certificate was filed changing the name of the Larm Mfg. Company, of Chicago, to the Harmless Spur Wire Company.

At New Orleans the freight rate on cotton to Liverpool has advanced to over 1 cent a pound, the highest point reached in many years. Ocean freights are high all over the world.

A TALK ON STEEL.

One of the features of the Scranton meeting of the American Society of Mechanical Engineers was the discussion of the query, "What experiences and phenomena can you describe as to the conduct of steels under the conditions in which you were using them?" At a previous meeting of the society so much interest had been manifested on the subject that it had been deemed desirable to give a more than ordinarily long allowance of time to this topic, and written and oral contributions had, therefore, been freely invited.

As a result Mr. W. W. Dingee wrote to the effect that the J. I. Case Threshing Machine Company use large amounts of machinery steel in the manufacture of threshing-cylinder teeth. This steel cannot be hardened with any certainty by any of the usual methods. The chief trouble with it comes from its uneven texture. It is not very uncommon to find a bar that may be broken like cast steel, when within a short distance of the break it can be bent cold.

Mr. Wm. Kent had sent samples of trusses for torsion balances, with spring steel wires stretched upon them, that had been under test for some months past in the factory of the Springer Torsion Balance Company. The longest of the three wires on the double truss had been twisted through an angle of 45°—that is, 22½° each side of its normal position 7,100,000 times. The two shorter wires on the single trusses had been twisted through an angle of 16° 2,200,000 times. These wires were stretched orginally to the notes C sharp and D above the staff respectively. After they had been twisted 1,000,000 times each the tone was tried again, and one of the wires appeared to have a tone half a semitone higher, and the other was about half a semitone lower than when the test was begun, possibly a mistake in the original tuning. After they had been twisted 2,000,000 times each the tone was found to be same as it was after 1,000,000 twists. As regards steel of low tensile strength Mr. Kent said: "The lowest tensile strength I have ever found in steel was 42,000 pounds per square inch. It was American open-hearth steel made for horseshoe nails. The composition was about, carbon, 0.10; phosphorus, 0.012; manganese, 0.20; silicon, 0.02. It was necessary to keep the phosphorus extremely low to secure the low tensile strength and great ductility desired." Concerning high tensile strength of watchspring steel Mr. Kent said: "Some three years ago I procured 13 samples of watch springs and tested them for tensile strength in a crude apparatus in which a strong spring balance was used to indicate the strain. The springs included a Jurgensen main spring, an English, a Waltham, a Waterbury and several other springs of various sizes and different tempers. The tensile strength of the whole lot of 13 varied between the limits of 300,000 and 375,000 pounds per square inch, a much less variation than might be expected considering the variety of sizes, tempers and sources from which they were obtained."

Mr. George R. Stetson had sent a broken drill. The singular regularity of the fracture was peculiar. The break was not at a shoulder, but about 1 inch from it. This piece of steel broke during the night after having been in the hands of a workman for several hours. The shank was forged from larger stock, and cooled by dipping in water. There was heat enough to harden it somewhat. The cooling no doubt caused the fracture, but why it should have taken several hours before the break occurred is difficult to understand. The steel stood rough handling, but broke during the night while lying on a machine, part being found on the floor. Mr. Stetson did not think it a good practice to hurry the cooling of steel in this way, although the water annealing of steel is usually satisfactory if carefully done. This breaking after hardening is not unusual, sometimes not developing for several days. One of the members spoke of such an incident happening after months. There may be foundation for the belief that clock and watch springs break during a thunder shower more frequently than at other times, and that a razor is improved in cutting qualities after lying unused for some time. He forwarded part of a large tap broken in hardening. The imperfection of the steel was apparent. Such a fracture is common with large tools; whether large tools that do not break have this imperfection or not it is impossible to know. The majority of sizes, 4 inches and above, that do not break show irregularity in grain. The question naturally arises, Why should so slight a cause produce this result? The most common breakage of taps in hardening is at about 1 diameter from the entering end of the tap. By screwing an iron washer over this end of the tool to keep the water from it this breakage, it was thought, could be lessened. This could be done by tapping out the center for a small machine screw, and holding the washer against the tool by this screw. Samples of drills cracked in hardening were shown. Much the larger loss from breakage on drills, larger than ½ inch, show this peculiar fracture. It is not confined to any part of the twist, though the samples are toward the shank or solid part of the drill. There was a peculiar uniformity in the fracture, and in all the hundreds which had been noticed the fracture never is reversed or pointing toward the shank.

Mr. E. Fawcett said: "Some time since we had occasion to make some large taps and dies for bridge bolts, and being in a hurry, the forger in annealing left them in a bed of charred (bituminous) coal on the forge over night to give them a good "soaking," as he called it. On working the steel we found it to have a very coarse crystalline structure and to be brittle. Needing them immediately, we finished them up, tempered and put them to work. One of them broke after threading some hundreds of nuts, but did not show as large a crystalline structure as before tempering; the others have been in use ever since. The steel was ordered for the special purpose from a well-known manufacturer in Pittsburgh, and had every appearance of being first class."

Mr. Levi K. Fuller said: In 1885 I had occasion to make a series of dies and punches for the Estey Organ Company, to be used in punching sheet brass for reeds, both block and tongue, for use in their organs. The steel was No. 4, Sanderson Brothers Steel Company, Syracuse, N. Y. The bar was cut into various sizes in a planer, heated in a charcoal fire and annealed in wood ashes. The specimens were then planed to various sizes and thicknesses, ranging from $1\frac{1}{16} \times \frac{1}{2} \times 3$ to $\frac{1}{2} \times 3 \times 3$. These were heated to a bright red, in accordance with the instructions printed upon the label on the bar of steel, and hardened in water and ground without the temper being drawn in the least. They were then subjected to grinding in an emery grinder to the proper sizes; they were ground on a frame but not confined, remaining loose so as to allow the steel to move, if there was any tendency in that direction. As the skin was removed upon one side the surface was slightly concaved, and they had to be turned over and ground upon opposite sides five times before they ceased changing their form. The various blocks were planed 0.010 thicker than the finished size to allow for grinding. They were ground 0.0001 inch alternately on each side, receiving a total of five grindings upon each side, reducing the total thickness 0.10 inch as above stated. After they had been ground a few hours, they began to crack, and nearly every one was ruined by reason of this tendency. In some cases they would break into a dozen pieces. I had communicated with Sanderson Brothers Steel Company, and they attributed the fact to overheating, but the description "a bright red" had been strictly followed, and had been none too high for similar steel for a like use. Samples of this were sent to Sanderson Brothers and tempered by them, and the temper slightly drawn, but it was not sufficiently hard to do the work. We then resorted to steel No. 5, same make, which had precisely the same treatment as first described, and which has resulted in no case in breakage. The work performed by the sample returned to us by the Sandersons was the punching of 5000 reeds without regrinding, while the No. 5 will punch 20,000, and with some thicknesses even more. The dies were perfectly square and were set with a piece of tissue paper 0.0005 in thickness between them, cutting a perfectly smooth edge.

Mr. Chas L. Houston wrote: "In the discussion at the Nashville meeting as to the significance of the peculiar curved lines which appear in the disturbance of the surface scale of steel boiler plates, caused by the strains of shearing, some of the members claimed that it was only a scale disturbance, and it did not indicate any injury to the metal. I have reason to believe, however, that it is an indication of injury to the body of the metal, and send herewith a piece of plate which had been so affected and afterward was stretched and broken in a testing machine. The lines show very plainly that the metal had been strained beyond its elastic limit, not only upon the surface but to some depth (as shown on the edges of test piece), so that when afterward it was stretched it did not so readily yield at these points, leaving elevations of slight extent upon the surface. The lines upon this sample are not so much the peculiar curved ones, the result of shearing, as they are those resulting from the curling of the narrow scrap at the shears and the subsequent straightening to prepare for testing. I have observed, as also have many other workers of steel, that metal of some degree of ductility when subjected to strains will sometimes crack like glass, showing no evidence of ductility at the point of fracture. I noticed some five years ago one striking case of a ⅝ plate of American made basic steel, which was sent to a locomotive works to try its flanging qualities. It was flanged into a locomotive throat sheet, the edges being first turned down and then the concave end worked out. The next morning a crack appeared at the opposite end which had not been heated at all, and had had the roughness of shearing removed by planing. This crack continued to extend for a week or ten days, until it reached the whole way across to the part that had been heated. This, of course, was due to the contracting strain at the flanged end, and the sides of the crack showed little or no evidences of having reduced or stretched at the fracture. I had a test piece taken from one side of the crack and prepared so that when pulled it had the crystalline face of the crack for one edge of the test piece. The test, taken nearly across the grain of rolling, showed a tensile strength of 68,580 pounds per square inch and a reduction of area of 42 per cent., with a fibrous fracture. I send one end of this piece, which, however, is almost too old and rusty to show its character. I also send some numbers of the *Journal* of the Franklin Institute, showing the results of some curious tests made by my father. One series, 1878, shows that steel and iron both when raised to

about 600° heat F. lose in ductility and gain in tensile strength; this is also corroborated by bending and tensile tests made in Europe and translated for the *Journal* of the Franklin Institute in 1885. Another set of my father's tests shows the effect of straining iron up to nearly its elastic limit and continuing the strain for 24 hours or more, the result being in some cases raising the elastic limit almost to the ultimate strength of the material."

Mr. Chas. T. Main remarked: During the year of 1883, when arranging the driving system of the Lower Pacific Mills, at Lawrence, Mass., it was thought that steel shafts for head lengths would be stronger and more desirable than iron. Accordingly quite a large number of these of 4 and 5 inches diameter were put in. The calculated sizes were amply sufficient to carry their respective loads, and the shafts were well supported by hangers near the pulleys and were firmly held. In less than a year two 5-inch shafts had broken in one place, and one in another place, and four 4-inch shafts had broken. These were replaced with forged iron shafts, which were subjected to the same conditions of load, speed, &c., the bearings remaining the same as before. The 5-inch shafts are still running under the same conditions. The 4-inch shafts are still running, although the conditions have more recently been changed. The other steel head lengths which did not break were all changed for iron with one exception, which still remains as it was.

Mr. H. D. Hibbard, of the Linden Steel Company, of Pittsburgh, called attention to the importance of giving as far as possible the history of the steel under consideration. "To those not engaged in its manufacture," he remarked, "steel is steel, but not necessarily so to those engaged in the business. Unless the history of its manufacture is known much of the other information about it is useless. Even with the chemical analysis known, which is essential, the great variations in physical properties due to different methods of manufacture and subsequent treatment may account for any anomalies, and unless these are known the mysterious element of the symposium will not be kept at a minimum. As no two plants are alike, no two methods alike, and no two men alike, the most complete description of the steel would indicate the name of the firm and man who made the steel. Then would follow the subsequent manipulation to put the steel in shape for use. Even then the mishaps it has met with from bad workmanship will never be known."

Mr. Oberlin Smith presented the case of a set of steel dies 4 inches square and 1 inch thick, in hardening which the jaws were found to crack so frequently that a large loss resulted. The explanation, of course, was that the relatively small jaws cooled so quickly, as compared with the large body of the die, that violent strains were set up. As a remedy, an arrangement was adopted by which the die, while undergoing hardening, was slowly revolved in a vertical plane and gradually lowered into the cooling liquid. The cooling thus proceeded from the outside, the outside corners first being acted upon. These occasionally cracked off, but only in a very small number of cases, and the method proved highly satisfactory. In hardening taps, Mr. Smith had found the outside portion to crack off in many instances. To obviate this, he recommended drilling a hole in the middle of one end, thus allowing the water to act on the inside and outside at the same time, in this way equalizing the strains resulting from cooling. Mr. Smith further attributed irregular strains in a great measure to lack of homogeneity in rolling or casting. Burning of the metal, he thought, resulted from the action of the air-blast in a forge, and, as a remedy, suggested a deep fire and exposure of the metal to radiated heat only.

Mr. J. E. Denton referred to the breaking of iron shafts on six Hoboken ferry-boats within one winter. One of the shafts had been in service less than a year and the others for periods of from three to five years. The breakage, it was thought, resulted from the adoption of iron paddles in place of wooden ones, but subsequent experiments showed them to be fully capable of withstanding the increased strain. Mr. Denton referred also to the breakage of Krupp-steel shafts on the Allegheny River, the steel in all cases having been found to be of good quality. As to the influence of the nature of the strain in producing fracture, attention was drawn to experiments with watch springs, which showed that if the strain was only small enough it could be applied an infinite number of times without damage.

Prof. John E. Sweet, in referring to hardened steel for standard gauges, remarked that length pieces were found to constantly change after hardening. With cylindrical pieces also, after having been accurately ground, it was found that after standing on end a few hours they became enlarged in diameter in a north and south direction. In order to prevent a change in length of gauges Mr. Geo. M Bond suggested leaving the gauges unfinished for six or eight months after hardening. The strains due to hardening, he remarked, were greatest at the end, and all gauges, before being sent out for use, should be heated a second time to a temperature higher than any they may be liable to encounter in practical use. Tests have shown such second heating to shorten the pieces. In the matter of equalizing the strains in taps from cooling Mr. Bond recommended drilling a hole clear through each tap, this having worked well with 6, 9 and 10 inch bridge taps. Mr. Bond further cited the case of a gauge 2½ inches in diameter, which, four days after having been hardened and finished, cracked through the middle, measurement, moreover, showing the end diameters to have become enlarged.

Capt. Robert W. Hunt spoke in an interesting manner of the effect of manganese on steel for gun barrels. During the Turko-Russian war the Winchester and the Smith & Wesson companies, it appears, had in hand large contracts for guns. Both firms for a time used imported steel. The Winchester Company wanted for their purposes soft octagon steel which would give a short chip in boring. In supplying such steel in this country it was found necessary to keep the manganese down to about 0.4 per cent., an increase over this causing a long chip and a rougher bored surface. As to the quality of steel, Captain Hunt held that primarily it was all good, but the men who handled it were careless and largely responsible for the erratic behavior of the metal. The quality of steel rails, he thought, was actually deteriorating, but as to the good old rails of which we sometimes hear—they had been shown to be chemically mean, the phosphorus often running from 0.07 to 0.15 per cent. The reason of their good behavior in use was purely physical, the steel being worked at a lower temperature.

Mr. F. H. Richards, in speaking of taps and dies, remarked among other things that in some New England shops forging small steel tools was considered a failure and orders had been given that such tools should be cut from the solid. Mr. Oberlin Smith remarked that hardening sometime caused steel rings to swell and sometimes to contract. Mr. Barr cited the case of 50 taps in which, after hardening and finishing, the threaded portions were alike in less than 6 pieces. Mr. Jerome Wheelock spoke of tempering valve stems 2½ inches in diameter and 9 feet long. These are kept below scaling heat and dropped into the water vertically. This method was almost uniformly successful. Prof. F. R. Hutton referred to some of the steel castings which had been turned out for the new war vessels built at Cramp's. In these heavy castings sharp angles had been carefully avoided. Mr. W. E. Crane, in closing the discussion, spoke of the shrinking by rehardening of the dies used in drawing brass tubes.

The Carnegie Concerns.

In our issue of last week we made mention of the fact that some important changes in the firm of Carnegie Bros. & Co., Limited, and Carnegie, Phipps & Co., Limited, at Pittsburgh, had taken place. Since that time some additional facts in regard to the changes have been brought out. The reason for the retirement of Henry Phipps, Jr., is his serious ill-health which threatened to become more serious if he continued in active service. The retirement of John Walker, who held the position of Chairman of Carnegie, Phipps & Co., Limited, was caused by difference of opinion between himself and Andrew Carnegie dating back to the big coke strike and subsequent events. Both gentlemen, however, severed their business relations with the understanding that the friendly personal relations would continue without interruption. On Thursday, the 18th inst., another change in the firm of Carnegie, Phipps & Co., Limited, occurred, E. A. Macrum who has held the position of treasurer of that firm for a number of years resigned and was succeeded by Lawrence P. Phipps, who is a nephew of Henry Phipps, Jr. On account of the many false rumors set afloat by the changes made in the firm the following statement was prepared and given out by Andrew Carnegie on the day after the changes were made.

At the request of Mr. Henry Phipps, Jr., Mr. D. A. Stewart was yesterday unanimously elected chairman of Carnegie Bros. & Co., Limited. Mr. Stewart, as is well known, has been one of the leading officers of the firm since its inception. He has for many years occupied the position of vice-chairman and attended to the duties of chairman during Mr. Phipps's absence. Mr. Phipps concluded his 28th year in the iron business this month, and felt that he should now be relieved from routine duties. His partners felt that he had deserved from them anything he asked, and gladly acquiesced. He is hereafter to occupy a similar position to that always occupied by Mr. Carnegie, that of consulting partner without salary. As heretofore, he will have full charge of all the finances of the various concerns. He retains his position in the firm as the principal partner next to Mr. Carnegie. Mr. John G. A. Leishman was elected vice-chairman. These changes required some corresponding changes in the firm of Carnegie, Phipps & Co., Limited, Mr. John Walker having sold his interest to the younger members of the firm. Mr. Wm. L. Abbott was elected chairman of Carnegie, Phipps & Co., Limited; Mr. H. M. Curry was elected vice-chairman and Mr. W. P. Palmer was elected secretary. Mr. Abbott entered the service of the firm 17 years ago, when quite a lad, at a small salary, and has risen step by step to his present position, having developed as he progressed. He was heartily congratulated by every one of his associates upon his deserved promotion, and enters upon the chief command with their cordial good wishes. Mr. Curry has been 16 years in the firm's service, having begun like Mr. Abbott as a young man at a small salary. All his partners rejoice over his fully earned promotion. Mr. Palmer, who has been promoted, has won his spurs by many years of distinguished service, and has been admitted to the firm as partner as his just reward. All other officials remain as before. In making these necessary changes the firm have adhered strictly to their well-known policy of promoting those of their own young men who have proved their ability and zeal during long years of service.

Carnegie, Phipps & Co., Limited, control the Homestead Steel Works at Homestead, Pa., the Lucy furnaces at Pittsburgh, and the Seventy-ninth Street Iron Works, or Lower Union Mills, also in that city. Carnegie Brothers & Co., Limited,

control the Edgar Thomson Steel Works at Braddock and the seven blast furnaces at that place, and also the Union Iron Mills on Thirty-third street, Pittsburgh. It is reliably stated that further changes are contemplated in both firms and will be made at an early day.

Providence Notes.

In a locked room in a shop in Pawtucket stands a machine, the invention of a Rhode Island gentleman, whose reputation as a civil and mechanical engineer is not confined to this country alone. It is a machine for making horseshoe nails, and represents seven years of experiment and study by Mr. John A. Coleman and the expenditure of tens of thousands of dollars. It is fully protected by patents, and, in the opinion of competent judges, men engaged in just this line of business, is destined to work a revolution in that industry. Across the room stands a larger machine designed for the same purpose, an admirable piece of work, but abandoned in the matter of some of its details now for the simpler form of the completed mechanism. A belt run through the partition brings the power, and, although the machine is not as yet run for commercial profit, several barrels of the finished product turned out during the perfecting of the mechanism are stowed in one corner of the room. The object sought was to make a nail which would be tougher than those in general use, which would not split and which would not crack the hoof—in short, a better nail in every way than any now in use. Mr. Coleman makes his nails by cold drawing from blanks considerably shorter than the finished article. The machine which takes advantage of simple natural laws is strictly automatic, the only attention required being that a supply of blanks shall be furnished, and these may be delivered in a tangle just as they are dumped out of a keg, and that the machine shall be kept well oiled. The essential parts are few in number and positive in action—in fact, the whole machine is wonderfully simple when the work it does is considered. The finished nails have as fine a polish as if rattled, and a long, even taper to a point as keen as a needle's. A new nail just from the machine dropped from the hight of a person's waist will stick upright in the floor at one's feet. These nails have been thoroughly and satisfactorily tested in competition with standard makes of horseshoe nails. Although the machine is larger than its commercial issue will be, as it represents the evolution due to years of thought and development, it presents an interesting study in the manifest employment of the most direct means to effect a desired result, and is mechanically very satisfying. The machine will occupy but little floor space, and its design combines grace with ample strength. It is attracting much attention from men in the horse-nail and allied industries, and within a few days the managers of a company of ironworkers, employing upward of 5000 hands, spent nearly half a day in inspecting the machine with a view to negotiate.

The New York, Providence and Boston Railroad has introduced a time-saving device in charging the cylinders of its gas-lighted cars. Formerly, cars were held at Stonington until their reservoirs were filled, a proceeding which frequently caused delay. Now, a car containing five large reservoirs has been put in service. This is charged at the Stonington gas plant in the company's yard, and the car is taken to New London, the car being charged while cars are waiting at that station, and obviating unnecessary delay.

The Edison Electric Light Company propose to lay an underground line through Thames street, Newport, which will be connected with their station on the hill by a pole line via Church street. Although the city authorities have not given permission to lay the wires, which they have no right to do, the company having never received a charter, it is understood that they will make no objection, and already the paving blocks along the east curb of the street are being removed so that the trench for wires may be dug.

The contract for lighting the new steamer Puritan, of the Fall River Line, has been awarded to the Edison Electric Lighting Company. There will be 1600 lamps of 16 candle-power each, for which current will be furnished by four 400 light dynamos. Two "straight line" engines will be motive power for the plant. The steamers Bristol, Providence and Pilgrim, of this line are also lighted by the Edison system, Armington & Sims engines being used as the driving power.

The improvements of the New York, Providence and Boston Railroad Company in and about this city have been extensive during the past three or four years. The latest improvement under way is the purchase of land between the railway and the projection of West Exchange street. It is a narrow tract on the south side of the railroad, containing four acres, or 174,240 square feet, and is undoubtedly the largest piece of land that has changed hands in this city for a long time. The company have begun their improvements by building a new engine-house, which will contain stalls for 20 engines, while from the building to the Atwell's avenue bridge tracks will be laid, principally for freight cars which are to be unloaded.

The Corliss Mfg. Company of this city have just finished three large boilers for the City Mfg. Company, of New Bedford, Mass.

LEONIDAS.

The Jennings-Beale Case.

The Supreme Court, at Pittsburgh, heard arguments on the appeal of B. F. Jennings, John Davis and T. D Jenkins from the Court of Common Pleas, of Armstrong County. Joseph G. Beale, together with Robert Flenniken and the defendants, formed the iron firm of Jennings, Beale & Co., Limited, which was engaged at Leechburg in manufacturing steel billets of the Siemens-Martin open-hearth process. In July last Beale filed a bill in equity against the other members in the firm, alleging that they were about to move the works without his consent at a cost of $20,000, which would work him irreparable injury. This, it was claimed by Beale, was in violation of the partnership articles, and, as he had lost confidence in the defendants, believing they were attempting to ruin the business, he asked for an injunction and the appointment of a receiver. The Common Pleas Court granted an injunction, and from this decision the defendants appealed. The defendants alleged that Beale, as manager of the works, was incompetent, and for that reason and because of trouble with the Amalgamated Association, a majority of the firm considered it advisable to remove the furnaces to some place near the residence of the Chairman, B. F. Jennings, that he might personally supervise the manufacture of the billets. The allegation that the defendants were trying to ruin the business is stoutly denied. The counsel for Mr. Beale intimates that the defendants are endeavoring to squeeze Beale out of the firm, and alleges that the trouble with the Amalgamated Association was occasioned by Mr. Jennings recklessly discharging men and precipitating labor troubles on the firm, which could have been avoided by a removal to Allegheny County. It is further alleged that Mr. Jennings became so reckless that he began dismantling the furnace and loading it on cars for transportation before he had secured a site for its re-erection. This removal would cost $25,000 to $30,000, the foundations would be a total loss and the new plant would involve an additional and needless expense of $23 per day.

The troubles in the management of this firm were before the Supreme Court at its recent session, in Philadelphia.

Torpedo Boats.

The naval maneuvers of 1887 abroad confirmed the opinion formed in 1886 that torpedo boats of small tonnage are not adapted for service at sea, and that their field of operations is restricted to operations on or near the coast and in harbors. The tendency at present is to build boats exceeding 130 feet in length, with displacements ranging above 90 tons, carrying machine and rapid-fire guns in addition to the torpedo armament. European powers have begun but a comparatively small number of torpedo boats during the present year, although a large number have been added to the strength of the fleets; but these have, in a majority of cases, been completed in fulfillment of old contracts. In general, it may be fairly said that the smaller type of torpedo boat, so highly thought of in 1885, has lost much of its prestige. The principal sources of weakness in the smaller boats have been found to lie in inefficient boilers and light construction of hull. A new boiler, invented by Messrs. Thornycroft & Co. has been largely adopted, and is giving very satisfactory results; and the tendency to work more material into the construction of the hull and protection of vital parts bids fair to overcome the second weakness noticeable in the earlier boats, in which so much was sacrificed for speed. The necessity of torpedo repair and supply vessels again made itself apparent during the naval maneuvers. In England a large and powerful vessel, the Vulcan, is building, and in Italy two vessels of this class are to be built. The Germans have appreciated the value of this class of vessel for some years, and have constructed division torpedo boats. These vessels are fitted with complete workshops and spare stores and are intended to accompany divisions of torpedo boats.

The difference of the speed of torpedo boats on trial and in actual service, almost always considerable, was well illustrated in the races of the English torpedo flotilla in the Channel, in which the victor attained a mean speed of but 16.25 knots per hour for five hours, while on the the original measured mile it realized a speed of 21 knots. This was also illustrated in the competitive trials of Russian torpedo boats of various types in the Baltic in September last, the loss of speed amounting to 2½ to 4 knots in boats but a year old. The single exception known to this rule is that of the Normand boat Svenborg, which realized in this trial its original trial speed. The trials of the Nordenfeldt submarine torpedo boats in England and Turkey have attracted considerable attention, and mark a new phase in torpedo warfare. Their present under-water speed of 4 or 5 knots is very low for efficient service against ships under way; but the attention of inventors and naval constructors is now directed to this type of boat, and doubtless it will be largely developed in the future. In a circular recently issued by the U. S. Navy Department calling for proposals for a submarine torpedo boat an under-water speed of 8 knots is deemed requisite. This circular probably indicates the most advanced thought and opinion in regard to submarine boats.

The Norway Steel and Iron Company of Boston, have decided to wind up their affairs and go out of business.

Iron in South Carolina.

South Carolina has so long been considered a purely agricultural State that it will be something of a surprise to many of the readers of *The Iron Age* to learn that almost as large an area of the State covers deposits of iron as constitute the iron region of Alabama, magnetic and specular ore are found in quantities on the Western slope of King's Mountain, in York, Spartanburg and Union Counties, also in Chester and Abbeville and in lesser quantities in many other counties of the State. Brown hematite is present in Pickem and Spartanburg Counties, and bog-iron ore can be found in every county in the State.

A century ago the iron mines of South Carolina were profitably worked, at which time there were seven furnaces in operation in the four counties of York, Anderson, Greenville and Spartanburg. The discontinuance of the industry was due in part the absence of cheap fuel, an obstacle which is now removed by the increase of railroad facilities and the development of coal mining at not a great distance.

The earliest record of iron making in South Carolina was in the year of 1773, when iron works were erected by Mr. Buffington, and which were destroyed by the Tories during the Revolution. Soon after the war several furnaces and forges were constructed, the more prominent being the Era and Etna Furnaces, in York County. The Era was erected in 1787 and the Etna the year after. The principal owner of these furnaces was William Hill, who is said to have invented a new blowing apparatus, which dispensed with the use of wheels, cylinders or other kinds of wind-producing apparatus. In 1802 an air furnace was built on Charleston Neck, and in 1810 there were two bloomaries in Spartanburg County, four in Pendleton, two in Greenville and one in York. About this time there was a small steel furnace and a nail factory. Five years later York County had, in addition to the plant already mentioned, a forge, a furnace, a rolling mill for making sheet iron, and a nail factory; and there were small iron works in several other localities.

As late as 1856 South Carolina had eight furnaces—one in York, one in Union, and six in Spartanburg County. Four of these furnaces then in operation produced 1506 tons of charcoal iron. The same year there were also three rolling mills—one each in Spartanburg, Union and York counties, and the three turned out 1210 tons of bar iron and nails. There were a couple of bloomaries in the State the same year. All of these furnaces and mills have since been discontinued on account of cheap methods of making iron having been inaugurated elsewhere.

The Magnetic Iron and Steel Company, recently chartered by the Secretary of State at Columbia, has purchased the greater part of the magnetic iron ore lode near the town of Blacks, in York County. The price paid for the property was $60,000. The tract contains a large deposit of magnetic ore, low in phosphorus and silica. The company is composed of wealthy capitalists from Birmingham and Atlanta. It is their intention to build a furnace at once, and afterward a rolling mill, which in turn is to be followed by other industries. A town is to be laid off, and a boom systematically worked up, and none know how to do this so well as the Birmingham gentlemen interested in this project, which is freighted with so much importance to the iron future of South Carolina.

The new Charleston, Cincinnati and Chicago Railroad runs through the lands of this company and the officials of this road claim that they can deliver coal to the furnaces of the new iron company at $2.50 a ton. There are large forests of pine upon the lands of the company from which charcoal can be obtained, sufficient to supply the needs of a charcoal furnace. In close proximity to the ore beds purchased by the Magnetic Iron and Steel Company are also extensive deposits of Oolitic limestone. The Chesaw Iron Works will shortly begin the erection of a new brick foundry 90 x 30 feet.

A Traveling Crane Worked by Electricity.

It has become a custom with the mechanical section of the British Association to devote the Monday to papers connected with electrical engineering. The first paper read on that day was by Mr. W. Anderson, who described a 20-ton traveling crane worked by electricity. One of the traveling cranes in the foundry of the Erith Iron Works was originally constructed to be worked by hand; but preparations had been made to apply wire rope driving at some future time. The crane is 39 feet 6 inches span, and consists of a pair of wrought iron girders resting on end carriages running on an elevated line of rails. The gearing for hoisting and longitudinal and cross traverse is on the top of the main girders, the hoisting chain passes from the barrel at one end over a pulley at the other, then back to the pulleys in the cross traversing carriage, which runs between the main girders, through a falling block, and thence to an anchorage under the barrel at the extreme end of the main girders. By this arrangement the crane occupies a moderate hight, and the hook can come within 3 feet of each wall.

The inconveniences and wear attending the employment of rope driving gear induced the author to try whether electricity might not be used with advantage. Messrs. Elwell-Parker, of Wolverhampton, were communicated with, and undertook to supply the dynamo and a motor suitable for the peculiar requirements of a heavy crane. The dynamo, which was intended to give 50 ampères at 120 volts with 1200 revolutions, was fixed in the main boiler house of the works, and was driven by a small horizontal engine by means of a link belt. The leads from the boiler house up to the conductor in the foundry are of 6 B.W.G. copper wire, while the conductor is formed of an angle iron bar 2 x 2 inches by ¼ inch, extending the whole 350 feet length of the shop, and has one face roughly ground and protected from rust by vaseline. The return current travels along one of the rails on which the crane runs. The motor, which is shunt wound, and constructed for 100 volts and 50 ampères, is fixed on the working platform of the crane beside one of the main girders. Its driving spindle carries a steel pinion which gears into a double helical spur-wheel keyed on to a shaft which runs longitudinally on the top of the girder, and is connected by nests of three bevel wheels, with friction clutch connections to the three shafts which command the several movements of the crane; the means of using the hand power being still retained. Two sets of speeds are arranged for each of the movements, viz.:

	Feet per minute. Slow.	Feet per minute. Fast.
Hoisting	3.4	10
Cross traverse	25	105
Longitudinal traverse	78	213

To provide against undue strains upon the motor an automatic magnetic cut-out is fixed on the crane, in addition to a fusible cut-out in the main leads, and for the purpose of varying the power and speed to meet the requirements of the foundry, a set of resistance coils is provided, governed by a special switch, by means of which different resistances can be introduced into the armature circuit of the motor, or the current can be cut off altogether; but so that it must be done by steps, and not suddenly, the connection between the motor and the conductors is by means of brushes pressed against them by elastic attachments. The handles for operating the several movements, the brake lever, the switch and the automatic cut-out, are collected together, so that a single attendant can readily work the crane from one spot. The crane was set to work in June last, and has continued to act satisfactorily ever since. As far as can be judged at present, there is no special wear to apprehend. The conductors act satisfactorily, though a considerable length is in the open air, and the dust, heat and smoke of the foundry do not appear to affect the working.

A New Heavy Grade Railway.—A correspondent of the *Times* gives an interesting description of the Brünig Railway, which has recently been opened between Lucerne and Bernese Oberland in Switzerland. The gradient is in places very steep, being as much as one in eight; and on this account special precautions had to be taken both in the up and the down journeys. Generally speaking, the Rigi system has been adopted. The locomotive turns a cog-wheel which runs on a toothed rack placed between the rails, and so the train slowly travels, or rather is dragged up hill. The cog-wheel is stopped, and the engine works in the ordinary way when a moderate gradient or level piece is met with. To check the too rapid descent of the train, the engine is fitted with a pneumatic counter-pressure action brake, which of itself is sufficient to stop the train. Besides this, each vehicle in the train is fitted up with a cog-wheel and rack similar to those used in the ascent, with drums on the axle to which clip-brakes are applied. By these appliances the speed can be regulated and the train stopped at any moment. There was another danger, however, incident to all railways to be encountered—namely the risk to the couplings during an ascent. Though the brakes on each vehicle would probably be sufficient in such a case, yet it was thought fit to take further precautions. When the train is at rest the brake is kept fully applied by heavy weights. These weights are lifted by steam-power, which is conveyed from the engine in flexible tubes. If a coupling breaks, the flexible tube conveying the steam also breaks, and the weights fall down automatically and check the motion of the carriages. It only remains to say that the gauge is a very narrow one, being only 1 m.

The report that the Kishpaugh mine, in New Jersey, has been abandoned because the vein had cut out proves to be incorrect. The facts are that the underground workings had gotten too far from the present slope to enable the managers to work economically. They have merely abandoned the old workings, the mine to be reopened on another part of the property when the iron business in New Jersey is in better shape.

In our description of the Loomis fuel gas plant at Tacony, Pa., published in *The Iron Age* of September 27, page 458, we stated erroneously that the exhauster used was a No. 3 Root. The size is No. 6, having a 12-inch inlet, while No. 3 has only a 6-inch inlet.

The Lorain Mfg. Company, of Lorain, Ohio, have completed and are now occupying the additions to their plant made this summer, consisting of a planing mill 100 x 50 feet, for supplying the bathtub department, together with an iron foundry 200 x 90 feet, for increase of soil-pipe output. Their floors now cover an extent of three acres.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington St., CHICAGO, October 22, 1888.

Pig Iron.—No material change has occurred since our last report, but there seems to be a little more inquiry and the volume of business is a trifle larger. As yet the situation offers no comfort to the buyer who is looking for lower prices, but, on the contrary, the position of sellers is steadily growing stronger. The jobbing foundries are increasing their consumption, if anything, and, though the large contracts for Castings, mentioned last week, are still in abeyance, they are confidently expected to be secured for this city. In the meantime the supply of Pig Iron is diminishing, according to the latest authentic information concerning stocks in makers' hands. In the month of September the decrease in stocks of Coke Pig Iron held in the West was no less than 15 %, notwithstanding an increase in production. A similar condition of affairs exists in the Lake Superior Charcoal Iron trade. The total stocks are but half as large as those held by makers six months before. In view of these facts the resumption of operations by furnaces which have been out of blast for repairs, or because of unremunerative prices, need excite no apprehension of an immediate decline in values. It would appear that their product is really needed to supply the actual requirements of consumers. Some brands of Southern Coke Iron which had been withdrawn from this market are again being offered here, but in limited quantities. American Scotch (Blackband) Irons are practically out of buyers' reach, the furnaces being sold up for the present, and about $22.50 being asked for No. 1 for future delivery. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, all numbers, $20 @ $21; Alabama Car-Wheel, $26.25; Jackson County Softeners, No. 1, $18 @ $18.50; Hocking Valley Soft Foundry, No. 1, $17.50 @ $18; other Ohio Soft Irons, No. 1, $17 @ $18; Lake Superior Coke, No. 1, $18 @ $19; No. 2, $17 @ $18; No. 3, $16 @ $17; Southern Coke, No. 1 Foundry, $17.75 @ $18; No. 2 Foundry and No. 1 Soft, $17.25; No. 3 Foundry and No. 2 Soft, $16.50; Gray Forge, $16.

Bar Iron.—Specifications for Car Irons are now making their appearance and some orders have already been placed. Mills quote 1.80¢ @ 1.85¢, flat, f.o.b. Chicago, for this business, but buyers allege their ability to find takers at 1.75¢. Contracts for more cars are on the carpet, and the mills are inclined to maintain their prices for Bar Iron in view of the large demand still to come from this source. While the miscellaneous demand for Bar Iron is not very heavy, consumers appear to be more urgent than usual for the prompt delivery of small lots. Jobbers are profiting from this state of trade and are running off their stocks rapidly. On ordinary specifications the mills quote 1.65¢ @ 1.70¢, f.o.b. mill, for Common Iron, half extras. Small lots are quoted at 1.90¢ @ 2¢ from store, according to quantity and quality.

Structural Iron.—Deliveries are being made on old contracts, but new business is very light, as is usual at this season. Small lots from store are quoted as follows: Angles, 2.35¢ @ 2.50¢; Tees, 2.60¢ @ 2.70¢; Beams, 3.80¢. On mill orders the following rates are named: Angles, 2.20¢ @ 2.25¢; Universal Plates, 2.25¢; Tees, 2.55¢ @ $2.65; Beams and Channels, 3.40¢.

Plates, Tubes, &c.—Business has improved very considerably in the past ten days. With the approaching close of the navigation season, marine work is looking up, as repairs will be made when vessels go into winter quarters. The outlook for Tank and Boiler work is very good, as many contracts are now being figured on, and some good orders, particularly for Tank Iron, have already been booked. Store trade was much heavier than usual during the past week. Prices are firmly maintained all along the line. We quote prices from store as follows: Heavy Sheets, Nos. 10 to 14, 2.65¢ @ 2.70¢; Tank Iron, 2.55¢; Tank Steel, 2.80¢; Shell Iron, 3¢; Shell Steel, 3.25¢; Flange Iron and Steel, 4¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 60 % off.

Sheet Iron.—The urgency of the demand for light gauges is now about over, and the mills are getting their business in better shape, making shipments more promptly and taking new orders at more reasonable prices. Small lots from store are still held at 3.20¢ for No. 24, 3.30¢ for Nos. 25 and 26, and 3.40¢ for No. 27.

Galvanized Iron. — Manufacturers' agents report new business quieting down, but deliveries on old contracts are still far in arrears, and they are experiencing much difficulty in supplying their customers. Stocks are so badly broken that it will take some time to put the warehouses here in condition to meet the demands of the pick-up trade. Small lots are still quoted at 60 % off for Juniata and 60 and 5 % off for Charcoal.

Merchant Steel.—Some heavy orders for Spring Steel are reported to have been placed during the past week, and the demand has been very good among general consumers. The volume of business is considerably heavier than that of September. Association prices are still as follows: Bessemer Bars, 2.30¢ @ 2.40¢; Tool Steel, 8½¢ @ 9½¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.40¢; Open-Hearth Spring, 2.90¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 10¢.

Steel Rails.—The only business now in progress consists of small lots for the absolute requirements of the roads. Orders for next year are discussed, and from 75,000 to 80,000 tons will be purchased in the course of the coming month for such delivery, if present indications do not prove false. So far but one company is known to have ordered a supply of Rails for 1889. Although makers do not anticipate a large business next year, the fact cannot be overlooked that the situation is more encouraging than it was at this time last year, when no railroads whatever were anticipating their wants. Quotations continue at $30 @ $31.

Old Rails and Wheels.—No transactions have transpired in Old Iron Rails, the views of buyers and sellers having been too far apart for business. An offer of $23.50 for 500 tons was refused by one holder, and $24 was rejected by another. Old Car-Wheels are nominally quoted at $19.50 @ $20.

Scrap Iron.—A sale of 1000 tons of No. 1 Forge is reported at $20. Old Horseshoes and Cast Machinery have met with some demand, and there have been free sales of low-grade Cast. Old Material is not at all abundant, and holders of Mixed Country Scrap ask $15. Selling prices of carefully selected Scrap are as follows, ₽ ton of 2000 lb: No. 1 Forge or Railroad Shop, $20 @ $20.50; Track, $19 @ $19.50; Horseshoes, $20; Axles, $26.50; No. 1 Mill, $15.50 @ $16.50; Pipes and Tank, $12 @ $13; Light Wrought, $11; Cast Machinery, $15; Stove Plate, $12; Cast Borings, $10; Wrought Turnings, $12.50 @ $13; Axle Turnings, $15.50; Coil and Leaf Steel, $17; Locomotive Tires, $15.50.

Hardware.—Wholesale merchants generally are busier than they were last week and are doing a more satisfactory trade than in September. The demand then ran largely into heavy goods, while now more Shelf Hardware is moving, making the aggregate of sales greater. An effort is being made to advance the price of Nuts, and the quotations sent out by different manufacturers seem to corroborate the report to that effect. Inquiries for Nuts and similar goods are increasing, as is always the case on an advancing market. Washers, however, are a drug, the demand for them being very light. Collections are improving and are very satisfactory in numerous sections.

Nails.—Manufacturers' agents report a scattering demand, which, however, has made a fair volume of trade in the aggregate, without special activity. Wire Nails seem to be moving a little more freely than Cut Nails, both from factory and store. Manufacturers' prices are now $1.90 @ $1.95, f.o.b. Chicago, for Steel Nails, and $2.55, same delivery, for Wire Nails. There are influences at work in the Cut-Nail market, however, which bid fair to demoralize manufacturers' prices very seriously if an understanding is not soon reached. The regular price for small lots from store is $2.10 for Steel Nails, and $2.60 for Wire Nails.

Barb Wire.—Business is stagnant, and jobbers' prices are unchanged at 2.90¢ for Painted and 3.60¢ @ 3.65¢ for Galvanized

Pig Lead.—Business has been at a standstill, in consequence of the failure of N. Corwith & Co., who came to grief as a result of their efforts to corner the supply of Lead. The local interests in Lead and its products do not seem to have been seriously affected, but it will take some little time to ascertain the full consequences of the failure, and meanwhile all parties will proceed cautiously. An impression prevails that the firm will be found to have assets sufficient to discharge their liabilities.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., October 23, 1888.

Pig Iron.—There is no perceptible change in the condition of the market, demand and supply being very evenly balanced. The feeling is one of steady firmness, consumers' requirements being sufficiently urgent to keep them continually in the market; and, as producers have no difficulty in placing their entire output, prices are naturally firm. In some cases sellers claim to be getting a little more money, which may perhaps be the case for small lots, quick delivery, but there are no indications of such a tendency in the general market. As already stated, prices are firm, but buyers are not inclined to contract for deliveries beyond the balance of the year, so that for the present values are not likely to show much change. A great many orders are said to be waiting for the result of the elections, and with the generally satisfactory condition of business it is thought that prices will advance if the Republican candidate wins. But the supply of Iron is very large, and will probably be larger still under the contingency mentioned, so that there may be some disappointment in regard to the matter of higher prices. And for the same reason there may not be the immediate decline which some people are predicting in case of a Democratic success. Apart from politics, the business is very satisfactory and for the time being there is no apparent reason for its being otherwise, hence the chances are that the volume of business will be large and prices steady, no matter who is elected. Meanwhile business in Pig Iron as regards future de-

liveries is held in abeyance, until matters are decided pro or con, prices being from $16 to $17, at tide, for Gray Forge; $17 @ $18 for No. 2 Foundry, and $18 @ $19.50 for No. 1, the majority of transactions being at medium figures, unless for strictly choice brands, which command outside prices. The scarcity of local Irons has been sufficiently marked to permit several lots of Southern and Western makes to be brought in, at prices within the limits above named, but the quantity taken was not large.

Blooms.—Fairly active at quoted rates, as follows: Nail Slabs, $29 @ $29.50, at mill; Billets from $32 to $36, according to analysis; Charcoal Blooms, $52 @ $54; Run-out Anthracite $42 @ $44; Scrap Blooms, $32.50 @ $34 ℔ "bloom" ton of 2464 lb. Foreign at tide, c.i.f., duty paid, $30 @ $31 for Nail Slabs; $34 @ $36 for 4 x 4 Billets, and $35 @ $39 for Siemens-Martin, price according to analysis, &c.

Muck Bars.—The scarcity continues, and good Bars would command $30 delivered, although some sellers quote $30.50 firm. Latest sales reported were at $29.50 @ $30, but it might be difficult to duplicate purchases in the present firm condition of the market.

Bar Iron.—There is a renewed inquiry for Bars from car builders, with prospects of several large lots being closed in course of a few days. Country and Western mills are said to have named low figures, but city mills are still firm at last week's prices, with a good deal of work to be got out within the next four or five weeks. Still, buyers can probably do a shade better than last week, as the capacity in operation requires an enormous amount of business, which manufacturers are willing to accept at about to-day's prices, say from 1.8¢ to 1.95¢, according to quantity, quality, specification of sizes, &c. Skelp Iron is firmly held at from 1.95¢ to 2¢, with several large sales reported at the inside figure. The demand does not appear to have been fully satisfied yet, and 2¢ is asked for early deliveries.

Plate and Tank Iron.—The week's business has been fairly satisfactory to sellers, but no changes in prices have been made, although they are somewhat firmer than they were during the early part of the month. The general demand for Plates has been very good, but the activity at the mills is largely due to this class of trade—viz., carload up to 50 or 100 ton lots. Large orders are expected to be on the market at an early date, chiefly from the shipyards, which, when secured, will give the mills a good start for their winter work. Prices are quoted as before—viz., Ordinary Plate and Tank Iron, 2.05¢ @ 2.15¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.3¢ @ 2.4¢; Shell, 2.7¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3½¢ @ 4½¢.

Sheet Iron.—A very heavy demand is reported, and mills are all completely cleaned out of stock. They are now running to their full capacity, endeavoring to meet the calls made upon them, but find great difficulty in doing so. Prices are firm at about the following for the best makes:

Best Refined, Nos. 26, 27 and 28	3¼ @ 3½¢
Best Refined, Nos. 18 to 25	3 @ 3¼¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28	4⅓ @ 4¾¢
Best Bloom Sheets, Nos. 22 to 25	4 @ 4¼¢
Best Bloom Sheets, Nos. 16 to 21	3½ @ 3¾¢
Blue Annealed	2.8 @ 3 ¢
Best Bloom, Galvanized, discount	62½ %
Common, discount	67½ %

Structural Iron.—There is no improvement in this department, new business being very much less than the current output. Many of the larger mills are running on short time, and, as far as we can learn, none are engaged up to their full capacity. New work is being talked about, but it is hardly likely that much business will be done until after the election. Meanwhile prices are unchanged, as follows: 2.10¢ @ 2.15¢ for Bridge Plate; 2¢ @ 2.10¢ for Angles; 2.6¢ @ 2.7¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel

Merchant Steel.—There is a good demand for all grades, and without change in prices, which are as follows: Tool Steel, 8½¢; Machinery, 2.6¢; Crucible Spring, 4½¢; Open-Hearth Ordinary Spring, 2.7¢ @ 2.9¢; Crucible Machinery, 5¢; Best Sheet Steel, 10¢; Ordinary Sheet, 8¢.

Steel Rails.—The demand is almost exclusively for small lots, for which $29 @ $29.50, at mill, is asked. Orders for 500-ton lots and upward might be taken at the inside figure, possibly a shade less for winter delivery, but $30 is asked for spring deliveries. The feeling is a little conservative on both sides, although the probabilities of lower prices are somewhat remote.

Old Rails.—No change whatever. There are buyers at $23 @ $23.50 and sellers at $23.75, in store, or $24 for shipments, but no transactions have been closed in this market so far as known.

Scrap Iron.—Good demand for all descriptions, and sales at about the following quotations: $21 @ $21.50 for cargo lots; $21.50 @ $22.50 for carload lots, delivered, or for choice $23; No. 2 do., $14 @ $15; Turnings, $13 @ $14; Old Steel Rails, $20 @ $21; Cast Scrap, $15 @ $16; do. Borings, $9 @ $10; Old Fish Plates, $25 @ $26. Old Car-Wheels, $17 @ $18, Philadelphia, or its equivalent.

Wrought-Iron Pipe.—The demand is less urgent than it was a week ago, but manufacturers have plenty of orders on their books, so that prices are steady and unchanged. Discounts are as follows: Black Butt Welded, 52½ %; Galvanized do., 42½ %; Black Lap-Welded, 62½ %; Galvanized do., 52½ %; Boiler Tubes, 60 %.

Nails.—The demand is very slow, and prices as irregular as ever. Quotations are supposed to be from $1.95 to $2, but there is neither firmness nor uniformity in prices at present.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave.,
PITTSBURGH, October 23, 1888.

The condition of the Iron and Steel industries has undergone no important change during the past week. Some branches of the Iron trade have been in an unsatisfactory condition all this year; the Nail trade has been very poor, and so much are some of our manufacturers dissatisfied with it that they have about concluded to abandon the business and turn their attention to something else which promises a better return. Then there is the Wrought-Iron Pipe trade; the mills have all been busy for several months past, but prices continue irregular and unremunerative, and the same is true of Steel Rails.

Pig Iron.—There has been very little change in the general situation during the past week. Business continues fairly active, while prices remain unchanged. There is not the activity there was a couple of months ago, nor is it to be expected in view of the fact that consumers generally are well stocked, while producers are well sold, so that the one is an offset to the other; many of the former have covered their requirements for the rest of the present year, and many furnacemen have contracts that will fully absorb their entire production during the time in question. It is the opinion of well-informed operators that there will be but little change in the general position of the market during the remainder of the present year. The consumption continues large, but so is production, and the latter is liable to be increased, as there are still some idle furnaces which can be started up. There is a continued absence of speculation. We quote prices as follows:

Neutral Gray Forge	$16.00 @	$16.50,	cash.
White and Mottled	15.00 @	15.50,	"
All Ore Mill	16.50 @	17.00,	"
No. 1 Foundry	18.00 @	18.50,	"
No. 2 Foundry	17.00 @	17.50,	"
No. 1 Charcoal Foundry	23.50 @	24.00,	"
No. 2 Charcoal Foundry	21.00 @	22.00,	"
Charcoal Mill	19.00 @	20.00,	"
Cold Blast Charcoal	25.00 @	28.00,	"
Bessemer Iron	18.00 @	....	"

Bessemer Iron is offering more freely, and, with consumers pretty well stocked, the market is weaker. One broker reports having 3000 tons to sell at $18, cash, but is unable to find a buyer. We can report a sale of Low Phosphorus at $20, and Low Silicon at $17.50, both cash; for standard brands of Mill Iron $16.50, cash, is an outside price.

Muck Bar—Is still quoted at $28.50 @ $29, cash, with a sale of 900 tons reported at $29.75.

Spiegel.—We can report a sale of 30 % Spiegel at $33, cash, and of 80 % Ferromanganese at $56.50, cash.

Manufactured Iron.—Manufacturers report little or no change in the general position of the market during the past week; there is a continued good degree of activity, although orders are mostly small, indicating that buyers are not generally inclined to anticipate future wants. However, the mills are all in operation, and there is a large business in the aggregate, with indications that it will keep up throughout the winter. Prices remain unchanged. Bars, 1.80¢ @ 1.85¢; Plates, 2.20¢ @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.90¢, all 60 days, 2 % off for cash; Skelp Iron is still quoted at 1.85¢ @ 1.90¢ for Grooved, and 2.10¢ @ 2.12¢ for Sheared.

Nails.—There is no improvement in the Nail trade. Demand continues very light for the season and there is not likely to be any improvement until the spring trade. Prices are unremunerative, although full card rates are being realized. We continue to quote 12d to 40d at $1.90, 60 days, 2 % off for cash. The Nail trade of Pittsburgh has dwindled down to very small proportions as compared with what it was years ago.

Wrought-Iron Pipe.—While orders are possibly not coming forward so freely, the mills are all pretty fully employed and likely to be this month and November, but prices continue unsatisfactory. The great trouble in this particular branch of the Iron business is a lack of organization and co-operation, and without it it is almost impossible to have satisfactory or uniform prices; for a year past each firm has been making its own prices, independent of each other. Discounts remain about as last quoted, as follows: On Black Butt-Welded Pipe, 52½ %; on Galvanized do., 45 %; on Black Lap-Welded, 62½ %; on Galvanized do., 52½ %; Boiler Tubes, 60 % off; 2-inch Tubing, 13¢ ℔ foot net; 5⅝-inch Casing, 40¢ ℔ foot, net.

Old Rails.—The only sale reported during the week was a lot of 4000 tons American Tees, at $25, cash, which may be regarded as the ruling price. Consumers generally are pretty well stocked, but the offerings are not large and holders are not pressing the market; they are not apprehensive of any immediate decline and are hopeful that the market may take a turn the other way.

Steel Rails.—There is no improvement in price; heavy sections are still quoted at $29, cash, on cars at mill in Pittsburgh. (The new mill of the Allegheny County

Bessemer Steel Company will, it is expected, be ready to start up about the 1st of the new year.)

Billets, &c.—Sales Bessemer Steel Billets, at $29.50, cash, at maker's works, and Nail Slabs, at $28.75 @ $29; Rail Ends and Bloom Ends quoted at $19 @ $19.50.

Merchant Steel.—There was a meeting of the Bessemer Steel Association the other day, but there was no change made in prices. Best Brands of Tool Steel, 8½¢; Crucible Spring, 4½¢; Crucible Machinery, 5¢; Open Hearth Steel, 2¾¢.

Railway Track Supplies.—Trade continues light, no change in prices. Spikes, 2¢, 30 days, delivered; Splice Bars, 1.80¢ @ 1.85¢; Track Bolts, 2.85¢ with square and 2.95¢ with hexagon Nuts.

Old Material.—There is a fair business at unchanged prices. No. 1 Wrought Scrap, $21, net ton; Wrought Turnings, $14.50 @ $15; Car Axles, $26 @ $27; Cast Scrap, $16 @ $16.50, gross; Cast Borings, $12 @ $13; Car Wheels, $20; sale short pieces Steel Old Rails, $18.50, gross.

W. H. Thompson and D. Summers, of Pittsburgh, have formed a copartnership under the style of the Pittsburgh Mineral Company, and will engage in the mining and shipping of the best grades of Manganese, Iron, Zinc, Lead Ores and Minerals. The office of the new company is located at No. 54 Fifth avenue, in the above-named city.

Samuel W. Hay, for a number of years with Howe, Brown & Co., Limited, Steel manufacturers, at Pittsburgh, has recently resigned his position with that firm and has located in the Hamilton Building, where he has commenced a general brokerage business in Metals and Ores. Mr. Hay has also secured the sole agency for the Sharon Steel Casting Company, of Sharon, Pa., and is prepared to quote prices on the manufactures of that firm.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts. } CINCINNATI, October 22, 1888. }

Pig Iron.—The most prominent feature of the local market for Pig Iron during the past week has been strength. But, while the market has been strong, there has been only a moderate volume of business. The discussion of the tariff and the coming Presidential election fills all branches of the Iron interest and many are the inquiries concerning transactions based upon the outcome. No other interest, apparently, feels so keenly or so closely the questions involved in "protection" and "free trade," and not a few purchases are made upon conviction of the result, yet the general disposition is to be conservative and to make only new contracts to cover orders already placed. Production of Pig Iron is heavy and new furnaces, as well as old ones blowing in, are adding their contribution to the output; at the same time, stocks are reported to be declining, reflecting an almost unprecedented consumption. Information comes by wire from Pittsburgh that an advance in the price of Coke is about to take place, and that the Coke wage-workers will receive some benefit thereby. The recent advance in freight rates has only strengthened the market for Iron. The demand for Southern Car-Wheel Iron has been quite active, and one lot of 6000 tons has been sold at $25, to be delivered 1000 tons per month for six consecutive months, delivery to begin in January, and 1000 tons No. 2 Southern Foundry has been sold at $17, and 1000 tons do. at $16.70, cash. 1000 tons Forge Iron sold at $15.25, but the majority of the individual sales have been small in amount. The following are the approximate quotations for the local market, cash, f.o.b. Cincinnati:

Hot-Blast Foundry.	
Southern Coke, No. 1	$16.50 @ $17.50
Southern Coke, No. 2	16.50 @ 17.00
Southern Coke, No. 3	15.50 @ 16.00
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	15.50 @ 16.00
Mahoning and Shenango Valley	17.50 @ 18.50
Hanging Rock Charcoal, No. 1	20.50 @ 22.50
Hanging Rock Charcoal, No. 2	19.50 @ 22.00
Tennessee and Alabama Charcoal, No. 1	18.50 @ 19.50
Tennessee and Alabama Charcoal, No. 2	17.00 @ 18.00
Forge.	
Strong Neutral Coke	14.75 @ 15.25
Mottled Neutral Coke	13.75 @ 14.00
Gray Forge	14.50 @ 14.75
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	20.00 @ 25.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	20.50 @ 21.50

Nails.—The market has remained firm, with a moderate volume of business. Jobbing prices are based upon 12d @ 40d, which sell at $2.10 ℔ keg, with 10¢ rebate in carload lots, at mills. Steel Nails sell at $2.10 and Steel Wire Nails at $2.75 ℔ keg.

Manufactured Iron.—There has continued to be a fair volume of business, and a firm tone has prevailed for Bar, Sheet, and Structural Iron, with full prices realized: Common Bar Iron, 1.90¢; Charcoal Bar Iron, 2.90¢ @ 3¢; Sheet Iron, Boiled, Nos. 10 to 27, 2.50¢ @ 3.25¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3½¢ @ 4½¢ ℔ lb.

Old Material.—There has been a better demand for Old Rails and the market has ruled steady, with sales of a few 100-ton lots, at $23, cash. There has been but little call for Old Wheels, but the offerings have been only moderate and the nominal rates current are $19 @ $19.50, spot, cash.

Detroit.

WILLIAM F. JARVIS & Co., under date of October 22, report as follows: More inquiries and for larger amounts have been received during the week than for some time past, and what is more to the point, several orders for round lots of Lake Superior Charcoal have been placed. A large demand for high numbers still continues, and very few furnaces have any quantities of these grades unsold. Consumers are still asking for quotations for next year's delivery, and some furnaces refuse to quote at all, and others that are willing to quote ask from $1.50 to $3 per ton advance over present prices. Some Mahoning Valley furnaces are having trouble in shipping No. 1 Iron as fast as called for on old orders and are unable to offer for prompt delivery at any price. There is a great scarcity of cars, and this is a source of annoyance to shippers, as they cannot get cars promptly even when they have the Iron on hand. We report business as satisfactory and the outlook as favoring the furnaces, with quotations as follows:

Lake Superior Charcoal, all numbers	$20.00 @ $20.50
Lake Superior Coke, all ore	19.75 @ 20.25
Lake Superior Coke, cinder mixed	18.50 @ 19.00
Standard Ohio Black Band	19.75 @ 20.25
Southern No. 1	17.75 @ 18.25
Southern Gray Forge	16.25 @ 16.75
Southern Silvery	17.00 @ 17.50
Jackson County (Ohio) Silvery	18.50 @ 19.00
Old Wheels	20.50 @ 21.50

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., } CHATTANOOGA, October 22, 1888. }

Pig Iron.—Matters appear to have settled down into a sort of conservative waiting. This may be accounted for, in a measure, on the part of furnacemen, from the fact that there is a demand for all their output, and there appears to be little doubt that this will continue. Speculation seems to have dropped out of sight, for, so far as can be learned, there is not even an inquiry from this class of customers. There have been term sales made for deliveries to run from January to July of the coming year at present current rates, and it is expected that before the year closes a very large proportion of the output will be so placed. The general opinion appears to be that the result of the election will make but little difference in prices or demand, although there is, of course, some anxiety expressed as to what the policy of the Government will be for the next four years. Freight rates on the lines reaching the Ohio River have been advanced again 20¢ ℔ ton, to take effect November 1, which, with the advance of October 1, of 15¢, makes now 35¢ to all points to the Ohio River and beyond over those of the summer.

Louisville.

LOUISVILLE, KY., October 22, 1888.

Pig Iron.—The market is quiet; prices are fairly held, and many buyers are willing to make purchase of Iron for extended delivery. Furnaces consider the situation satisfactory, and in many instances are accepting orders for future delivery. There have been a few large sales during the week in lots of 500 tons, these, however, at a slight concession in price. Some buyers think that after the Presidential election a decided improvement will take place, while others consider that the market will but hold its own, and that prices will remain at present figures. The demand for Old Rails has fallen off, and the market is decidedly weaker; Old Rails are held at $23, and Old Wheels at $21. We quote as follows:

Southern Coke, No. 1 Foundry	$17.00 @ $18.00
" No. 2 "	16.00 @ 16.50
" No. 2½ "	15.50 @ 16.00
Hanging Rock Coke, No. 1 Foundry	17.25 @ 17.75
Hanging Rock Charcoal, No. 1 Foundry	21.00 @ 23.25
Southern Charcoal, No. 1 Foundry	18.00 @ 18.50
Silver Gray, different grades	14.50 @ 15.25
Southern Coke, No. 1 Mill, Neutral	14.75 @ 15.25
" No. 2 " "	13.75 @ 14.75
" No. 1 " Cold Short	14.25 @ 14.75
" Charcoal, No. 1 Mill	15.75 @ 16.50
White and Mottled, different grades	13.50 @ 13.75
Southern Car-Wheel, standard brands	23.00 @ 24.00
Southern Car-Wheel, other brands	19.25 @ 21.25
Hanging Rock, Cold Blast	22.25 @ 25.25
Hanging Rock, Warm Blast	19.25 @ 20.25

Cleveland.

CLEVELAND, October 22, 1888.

Iron Ore.—Eastern furnacemen have been in the market during the past week, and have bought liberally of such Ores as can still be obtained. Transportation rates are still surprisingly low for this time of the year, and charters from Escanaba to lower lake ports are made every day at $1.25 per ton. With correspondingly cheap freights from Marquette, Ashland and Two Harbors, buyers are able to make their concluding purchases at prices quite in keeping with the quotations for Pig Iron. Menominee Ores, non-Bessemer quality, are held a little more firmly, sales at $4.25 @ $4.40 being reported, while Bessemer Ores from the same range bring $5.50 readily, with a few lots of extra quality bringing $5.60. Red Hematites, non-Bessemer quality, are selling for $5.15 @ $5.30, f.o.b. cars, Cleveland and lower lake ports. Lake and all-rail shipments from the upper lake districts closely aggregate 3,450,000 tons, and last season's totals are being rapidly overhauled. The market has a very healthy tone, and there is no indication of weakness anywhere. The mine owners are rushing down the Ore with all possible speed, and all available vessels will be kept busy until forced to tie up for the season.

Pig Iron.—While the demand been fairly active, with a satisfactory number of sales reported, the approaching election is having its effect upon the mar-

ket. The attention of manufacturers as well as of buyers and sellers generally seems to be directed toward the momentous question to be answered on the 6th day of November. Add to this the special interest which Iron men are taking in the result of the election and its relations to their own interests and it is not difficult to account for any existing dullness. While dealers do not anticipate any large orders until the middle of November, every condition of the market seems favorable for a good trade when the entire attention of both buyers and sellers can be given to it. Mahoning and Shenango Valley Mill Irons are in particularly good demand, while No. 1 Foundry is selling freely, buyers seeming to be anxious to increase their stocks before any advance in prices occurs.

Manufactured Iron.—Common Bar at 1.70¢ is in fair demand, while Sheets of every grade are very scarce.

Scrap Iron.—Old American Rails are still held firmly at $25, with no considerable sales reported. Indications are not wanting, however, of a break, and this will be followed by very vigorous sales of accumulated stocks.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, October 24, 1888.

American Pig.—The tone of the market has not changed perceptibly, the volume of business being small, though prices remain firm. Consumption is apparently going on at a heavy rate, the majority of furnace companies reporting that their deliveries are very heavy. We continue to quote Standard to Choice No. 1, $18 @ $19; No. 2 Foundry, $17 @ $17.50, and Gray Forge, nominally, $16 @ $16.50.

Scotch Pig.—The market is very quiet, with prices remaining: Coltness, $21.50, nominally; Shotts, $20.75 @ $21; Langloan, $21, and Dalmellington, $20.25 @ $20.50.

Plates.—We quote Iron Tank, 2.1¢ @ 2.2¢; Shell, 2.3¢ @ 2.4¢; Steel Tank, 2.2¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.65¢ @ 2.75¢, and Fire-box, 3.5¢ @ 4¢.

Structural Iron.—We quote Sheared Plates, 2¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.2¢; Angles, 2.1¢ @ 2.15¢; Tees, 2.5¢ @ 2.6¢, and Channels and Beams, 3.3¢.

Bar Iron.—We quote: Carload lots, half extras, 1.65¢ @ 1.7¢ for Common; 1.7¢ @ 1.8¢ for Medium, and 1.8¢ @ 1.9¢ for Refined, with prices for fancy brands running up to 2.4¢ @ 2.5¢.

Steel Rails.—The only transactions of any magnitude are reported by one Eastern mill, aggregating 30,000 tons, of which 7000 tons are for a Southern road and 23,000 tons for Eastern roads, all 1889 delivery. The market is feverish, with a good deal of quiet work going on and much uncertainty as to the prices which are actually being made at mill both for this year and next. There seems to be little question, however, that low figures have been accepted. We quote $27.50 @ $28 at Eastern mill for large quantities, standard sections. There are a number of inquiries in the market, among them some from Eastern trunk lines. One of them for 4,000 tons of 80 pound rails and 6,000 tons of a lighter section is to be placed to-morrow.

Spiegeleisen.—We note sales aggregating about 5000 tons to an Eastern Rail mill at private terms. The market is irregular and difficult to quote. We quote: 80 % Ferromanganese, $54 @ $54.50, with a few small sales reported.

Wire Rods.—Some confusion has been created by offerings of foreign Bessemer Rods at $38.50 @ $39. Foreign Basic Rods may be quoted $39 @ $39.50 for forward delivery. It is reported that the German Wire Rod combination has broken, with little prospect of its renewal for the present.

Old Rails.—We hear of a sale of 600 tons of Foreign Tees at a price equivalent to $23.50, Jersey City, and of a few smaller lots aggregating a little over 1000 tons, at private terms, to a manufacturer in the West. Negotiations for additional blocks are pending. We quote $23 @ $23.50 for Tees.

Metal Market.

Copper.—Spot Chili Bars improved since our last report from £78 to £78. 10/, and futures from £78 to £78. 15/, good merchantable from £77. 10/ to £78. 5/, Best Selected remaining unaltered £82. The following cable was received last week: "A preliminary agreement between the French syndicate controlling the Copper market and the Rio Tinto Copper Company has been signed. It is stated that negotiations have been concluded by which the contracts at present existing between the syndicate and the American companies will be renewed for a term of 12 years." Our own market was apathetic; two December contracts were sold yesterday at 17.70¢, but there were no further buyers. Spot and October are quoted 17.35¢ @ 17.40¢, and Casting brands 16¢ @ 16½¢.

Tin.—The London quotations came slightly better, spot advancing from £102 to £103 and futures from £102. 10/ to £103. 12/6. Total sales for the week, 790 tons. The Billiton sale at Batavia averaged 63 guilders ℔ picul. As per cable from Gilfillan, Wood & Co., Singapore, to Mr. Charles Nordhaus, East India agent, 89 Water street, New York, the shipments of Tin from the Straits Settlements to this country during the first half of October have been 450 tons, against 50 last year; and to England 700 tons, against 400; since January 1 they were, respectively, 2650 tons, against 4050, and 14,400 tons, against 10,400 tons. Sales in this market were confined to 105 tons at 23.05¢ @ 23.20¢ November, and 23¢ @ 23.05 December, the closing quotation being 23¢ November, and 22.85¢ December, 23.40¢ being asked on the spot, and 23.75¢ for October. The jobbing demand is moderate. *Tin Plates.*—During the past week only a moderate demand has been noticeable, which has been rather a disappointment to dealers, and prices are in some cases again easier. There is not much doing in futures, as the makers are still working on old orders and disinclined to meet buyers' views. The market in Liverpool is not over 13/6 for Coke Tins. We quote at the close to-day, large lines on the spot, Siemens-Martin Steel, Charcoal finish, $5 @ $5.75; Coke finish, $4.70; Ternes, $4.20 @ $4.35; Bessemer Cokes, $4.45 @ $4.50, and Wasters, $4.25.

Lead.—Soon after our last week's report the failure of Messrs. Nathan Corwith & Co., New York and Chicago, was announced, news which fell on the Lead market like a clap of thunder, inasmuch as it came a great deal sooner than had been expected. That the speculation for a rise the firm was engaged in since the beginning of the year was extra hazardous was the opinion, we believe, of the majority of people in the Metal trade in this city, yet as the firm was considered, if not very rich, at least disposing of large means and credits, it was thought a collapse was not near at hand. But the disappointment felt about the fall trade and the consequent holding back of consumers as buyers, deprived the speculation of a chance to get out at least square. As matters stand at present it is thought that the total loss of the firm will be found not to exceed $400,000, and that, perhaps, it may be able to pay 75¢ to 80¢ on the dollar after winding up. It is believed the senior member of the firm will withdraw from the house and the Lead trade. Some estimate the present holdings of the house in store at not exceeding 10,000 tons, while others think it may be 20,000 to 25,000 tons, not counting future contracts with smelters. There is as yet too much confusion and guesswork to arrive at the precise status of the firm's position in its relations to the general Lead situation. There are powerful interests not to let Lead decline in the near future beneath 4¢, money having been advanced on Lead in store by banks and by prominent dealers. The smelters have bought Ores at high figures on their sales to arrive to Corwith. Manufacturers do not hold much beyond present wants, and, though their trade is not brisk, yet at about 4¢ they may be willing to replenish supplies, though but moderately. Sales have been from 4¢ down to 3¾¢, and back to 4¢. The closing out of contracts under the rules has contributed about the weakest feature, and, till all are closed out, will continue doing so. Matters may, under the circumstances, remain more or less the same for some time longer. When the market will be left to shift for itself the larger production this year may be felt, and it may be found that the instrinsic value of Lead stands somewhere between 3½¢ and 3¾¢. In the aggregate the sales for the week foot up to 3300 tons at the Exchange alone, 2550 tons thereof being "under the rule" at the figures printed in our usual weekly summary elsewhere, the market closing 3.95¢ bid and 4¢ asked. How long the market will receive support from brokers, dealers and smelters and refiners remains to be seen. This year has been exceptional in the way of light consumption, though not in the way of a heavy output, since the prospect of further additions to the supply next year from the Rocky Mountains is spoken of as strong. Corwith took the surplus this year, which has not gone into consumption. He had contracted for future supplies, which must now seek a market again. The raw material being paid for, consumers will therefore act conservatively, since the outlook is in their favor, unless the demand for manufactured goods should develop in an exceptional manner during the dull season. London gave way all the way to £12. 5/ @ £12. 7/6, but comes to-day £13. 15/ Soft Spanish and £14 English Pig.

Spelter.—At the West Blende Ores remain as high as they ever were in this country—$30 ℔ ton—and some smelters hold at 5½¢ in New York, the current price paid in a moderate way being 5¼¢ @ 5½¢, while Silesian, which recovered to £19 in London, cannot be sold below 6¼¢.

Antimony.—There is little Hallett here, while the demand is good at 10¾¢. Cookson is strong at 12½¢ @ 13¢. Hallett remains steady in London at £42.

New York Metal Exchange.

The following sales are reported:

THURSDAY, October 18.

10 tons Tin, December	23.00¢
64 tons Lead, October	4.25¢
32 tons Lead, November	4.20¢
16 tons Lead, October	4.50¢
16 tons Lead, October	4.10¢
16 tons Lead, November	4.10¢
16 tons Lead, October	4.15¢
50,000 lbs. Lake Copper, January	17 15¢

FRIDAY, October 19.

80 tons Tin, November	23.15¢
10 tons Tin, November	23.20¢
16 tons Lead, December	4.00¢
32 tons Lead, December	3.92½¢
100 tons Lead, December	3.90¢

48 tons Lead, spot..... 4.00¢
16 tons Lead, spot..... 3.97½¢
96 tons Lead, spot..... 3.95¢
96 tons Lead, October..... 3.95¢
96 tons Lead, November..... 3.90¢
16 tons Lead, spot..... 3.92½¢
16 tons Lead, spot..... 3.90¢

(Under the rule.)

180 tons Lead, November..... 3.87½¢
100 tons Lead, spot..... 4.02½¢
98 tons Lead, October..... 4.07½¢
100 tons Lead, November..... 4.00¢

SATURDAY, October 20.

(Under the rule.)

100 tons Lead, October..... 4.00¢
100 tons Lead, October..... 3.97½¢

MONDAY, October 22.

(Under the rule.)

82 tons Lead, delivery October 24..... 4.00¢
208 tons Lead, delivery October 25..... 4.02½¢
16 tons Lead, November..... 4.02½¢
80 tons Lead, November..... 4.00¢
66 tons Lead, spot..... 4.00¢
100 tons Lead, October..... 3.97½¢
32 tons Lead, October..... 4.00¢
16 tons Lead, November..... 3.97½¢

TUESDAY, October 23.

16 tons Lead, November..... 4.00¢
32 tons Lead, November..... 3.97½¢
16 tons Lead, November..... 3.95¢
10 tons Tin, December..... 22.85¢
50,000 lb Copper, December..... 17.70¢

(Under the rule.)

410 tons Lead, spot..... 3.90¢
100 tons Lead, spot..... 3.87½¢
210 tons Lead, November..... 3.90¢

WEDNESDAY, October 24

16 tons Lead, spot..... 3.95¢

(Under the rule.)

55 tons Lead, cash..... 3.95¢
110 tons Lead, cash..... 3.80¢
108 tons Lead, cash..... 3.85¢
110 tons Lead, cash..... 3.90¢
100 tons Lead, October..... 4.00¢
50 tons Lead, October..... 4.05¢

Coal Market.

The Anthracite Coal trade betrays some signs of weakness now that the pressure for early delivery has in a measure subsided, and especially in the face of a continued heavy production at the mines. For some of the domestic sizes alone is there any scarcity, while Broken and the small steam sizes are in excess at lower prices. The most striking feature is the enormous output, the total for the week ending October 20 amounting to no less than 968,540 tons, an aggregate rarely, if ever, surpassed. Compared with the previous week the increase is over 132,000 tons, and compared with the corresponding week last year the increase is 240,000 tons. Since January 1 the aggregate is 30,270,430 tons, against 27,554,975 tons for the same time in 1887. Wyoming alone last week put out 528,800 tons, an increase of over 90,000 tons. Consumers will not fail to notice the tendency to accumulation, and the probable effects of an excessive supply later in the year. Producers, on the other hand, intimate that restriction will be enforced so far as may be deemed necessary.

Quotations are unchanged—viz: Hard White Ash, Lump, $4.50; Broken, $4.15; Egg, $4.40; Stove, $4.65; Chestnut, $4.55; Free-Burning, f.o.b., Broken, $3.95; Egg, $4.30; Stove, $4.65; Chestnut, $4.65; Pea, $2.75. It is reported that considerable orders have been placed at a cut of 30¢ @ 45¢. Bituminous Coal is being used more generally for manufacturiug purposes, and despite the increased production all receipts are quickly absorbed. For the week Cumberland reports 68,000 tons and Clearfield 62,500, while Beech Creek and Pocahontas each send about 30,000 tons. Pool prices are $3.25, f.o.b.

Vessels are scarce and quoted $1 to Boston, free of discharge.

It is stated that the Standard Cannel Coal Company, of Tennessee, have secured contracts to furnish for the different gas companies of New York City 20,000 tons of Cannel Coal from the mines at Newcomb. The Lehigh Valley Company will extend their Southern Central Division from Sterling Junction, on the northern border of New York State, to Oswego, one of the best markets of the State.

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from October 13 to October 18, inclusive, and from January 1 to October 18, inclusive, were as follows:

Iron and Steel.

	Oct. 13 to Oct. 18.	Jan. 1 to Oct. 18.
	Tons.	Tons.
Pig Iron: Dana & Co.	500	1,001
James Williamson & Co.	400	4,900
G. W. Stetson & Co.	100	13,050
Crocker Bros.	100	10,197
Spiegeleisen: Naylor & Co	505	9,633
Crocker Bros.	109	9,845
Ferromanganese: Naylor & Co	100	375
Steel: Oelrichs & Co.	98	198
R. H. Wolff & Co.	48	514
A. Milne & Co.	34	1,106
W. F. Wagner	21	1,210
F. S. Pilditch	7	464
Steel Rods: Naylor & Co.	460	16,918
R. F. Downing & Co.	100	3,424
Cary & Moen	26	759
Steel Blooms: Naylor & Co.	254	2,166
Steel Sheets: Naylor & Co.	25	515
Steel Billets: J. Abbott & Co.	113	1,751
Steel Hoops: A. R. Whitney & Co.	140	2,254
Steel Wire: J. A. Roebling's Sons	11	191
Swedish Iron: A. Milne & Co.	21	359
Rivet Rods: J. Abbott & Co.	200	4,388
Muller, Schall & Co.	15	185
Sheet Iron: T. B. Coddington & Co.	35	1,284
Iron Beams: Post, Martin & Co.	1½	4½
Charcoal Iron: Page, Newell & Co.	156	328
A. Milne & Co	118	174
	Boxes.	Boxes.
Taggers Iron: Phelps, Dodge & Co.	205	310
Bar Iron: N. Lilienberg	200	403
Iron Wire Rods: N. Lilienberg	100	500

Tin Plates.

	Boxes.	Boxes.
Phelps, Dodge & Co.	14,594	471,163
N. L. Cort & Co.	2,513	92,638
T. B. Coddington & Co.	2,336	140,485
Bruce & Cook	1,461	82,597
Jas. Byrne & Son	1,369	32,854
Dickerson, Van Dusen & Co.	1,207	230,006
Merchant & Co.	847	19,298
G. B. Morewood & Co.	736	40,681
Pratt Mfg. Co.	548	142,714
R. Crooks & Co.	466	58,394
Wolff & Roesing	374	81,510
Hy. Whittemore & Co.	369	44,679
E. S. Wheeler & Co.	100	6,809
Taggers Tin: Phelps, Dodge & Co.	390	390

Metals.

	Pounds.	Pounds.
Tin: Crooke S. & Rfg. Co.	36,833	219,119
Hendricks Bros.	22,406	504,560
Lemaier, Sons & Co.	22,400	88,030
Lead: American Metal Co.	22,148	22,148
	Casks.	Casks.
Antimony: Edw. Hill's Sons & Co.	100	1,350

Hardware, Machinery, &c.

Andreas & Co., Mach'y, cs., 3
Bernard, Geo., Ironwork, pkgs., 25
Boker, Hermann & Co., Mdse., cs., 22
Curley, J. & Bro., Cutlery cs., 7
Dolge, Alfred, Mdse., cs., 5
Folsom, H. & D., Arms, cs., 9
Field, Alfred & Co., Mdse., cs., 32; Anvils, 20; Chains, cks., 2; Hdw., cse., 1; Gun Caps, cs., 10
G. Laenser, Hdw., cs., 4
Hartley & Graham, Arms, cs., 22
Hawley, E., Mach'y, cs., 8
Junge, F. W. & Co., Mdse., cs., 3
Lau, J. H. & Co., Arms, cs., 25
Merchants' Despatch Co., Mach'y, cs., 35
Newton & Shipman, Files, cks., 5
Pierson, H. R. & Co., Ironware, pkgs., 291
Pioneer Iron Works, pump, cse., 1
Pose, —, Mach'y, cse., 1
Schulte, Wm. & Co., Mdse., cs., 22
Shoverling, Daly & Gales, Arms., cs., 36
Sellers, W. B., Mdse., cs., 5
Ward, Asline, Mdse, cs., 3
Wafelaer, Louis, Nails, cks., 87
Wenz, Ad., Mach'y, cse., 1
Wiebusch & Hilger, Lim., Mdse., cs., 13; Arms, cs., 3
Witte, John G. & Bro., Cutlery, cs., 2; Needles, cse., 1
Order, Mach'y, cs., 2

Irons and Metals Warehoused from October 13, to October 18, Inclusive:

	Tons.
Charcoal Iron: A. Milne & Co.	10
	Pounds.
Lead: Schultz & Ruckgaber.	901,447

Exports of Metals.

	Oct. 13. to Oct. 18.	Jan. 1 to Oct. 18.
	Pounds.	Pounds
Copper: J. Abbott & Co.	17,204	11,364,030
Lewisohn Bros.	.....	3,029,022
F. A. Lomal	.....	2,581,293
American Metal Company	164,900	5,794,862
G. H. Nichols	.....	223,939
J. Bruce Ismay	.....	112,000
S. Mendel	.....	560,000
Ledoux & Co.	.....	110,276
Muller, Schall & Co.	.....	430,000
Copper Queen Con. M. Company	.....	224,054
J. Kennedy, Tod & Co.	.....	112,026
H. Becker & Co.	.....	1,250
Orford C. & S. Rfg. Company	.....	449,881
Robt. M. Thompson	.....	125,000
Thos. J. Pope, Sons & Co.	25,000	1,451,130
J. Parsons & Co.	.....	420,000
Naylor & Co.	.....	448,809
Bridgeport Copper Company	.....	112,000
C. Herold	.....	250,000
Phelps Bros.	.....	6,250
R. W. Jones	.....	189,984
Ladenburg, Thalmann & Co.	.....	229,371
W. H. Crossman & Bro.	.....	4,000
R. Crooks & Co.	.....	1,000
Copper Matte: Williams & Terhune	530,880	35,348,018
Lewisohn Bros.	.....	3,021,610
American Metal Company	141,023	3,255,666
J. Abbott & Co.	.....	295,000
C. Ledoux & Co.	454,000	939,800
F. W. J. Hurst	.....	184,288
G. H. Nichols	.....	722,777
H. T. Nichols & Co.	.....	180,995
Kunhardt & Co.	.....	41,652

Financial.

While there is noticed no special activity in business circles, accounts are generally favorable as respects local trade, dry goods jobbers, grocery men and others reporting a tendency to improvement. There is more than usual desire to take advantage of low freights prior to the close of navigation, and in the Southern trade there is a decided increase, stimulated by the gradual disappearance of yellow fever. The approximation of the wheat market to normal prices is also a favorable omen. Under present conditions grain exports are practically suspended, excepting from the Pacific coast. Trading in wheat is slow, but speculation is encouraged by easier money. Spot cotton is dull and about steady. High rates at Southern ports operate to retard shipments. Chicago advices are that "the general mercantile trade is moving along fairly well, present prospects seeming to indicate that it will be protracted over a longer period than was anticipated earlier in the season. The unsettled state of the grain markets and the lateness of the corn crop is delaying collections more or less in some sections of the country. This, together with the shortage in the wheat crop, tends to retard buying to some extent." A notable feature of the times is the shortage of rolling stock on the principal railway lines. "On Saturday last," says the Cleveland *Plaindealer*, "the Nickel Plate was 3000 cars short, the Bee Line 1700 and the Lake Shore and other roads in the same condition. The pressure from the East seems to be lessening." A Pennsylvania railway official is reported as saying that it is almost impossible to place any new orders for locomotives at the present time, all the works being full, and the railroads of the country everywhere want more cars. Largely increased earnings are looked for when once the corn crop is fairly in motion. The gross earnings of 73 railroads for the first week of October show an increase of $61,648, or 1.17 %. The Chesapeake and Ohio Railroad has given orders to double its freight equipment, proposing to build up a great export business at Newport News by shading export rates.

The dullness of the Stock Exchange was relieved on Monday by the supposed consummation of the project long pending for the consolidation of important lines of Southern railways. The parties to the transaction are the Georgia Company, controlling the Central Railroad and Banking Company of Georgia and the Richmond and West Point Terminal Railway Company. President Inman, of the Terminal Company, says: "We have bought the Georgia Company's property. The details as to terms are not yet definitely settled, but it can be positively stated that the deal will go through. We obtain control through the purchase for cash of $12,000,000 of the Georgia Com

pany's stock, for which $4,200,000 is to be paid. The purchase will bind together under a single management all the railroad properties in that section of the South penetrated by the Terminal and the Central systems, the union being made more important by the leases of the East Tennessee, Virginia and Georgia, the Georgia Pacific and the Knoxville and Ohio railroads, which have been closed by the Terminal or its controlled companies. Our line of steamers from Savannah to New York will be established, which will give the consolidated system control of every important port in its territory." Large sales of Union Pacific were a feature of the week, this stock advancing on the improved financial statement of President Adams. The failure of Corwith & Co., of pig-lead fame, had an unfavorable influence. Chief among the depressing influences of the week was the unsatisfactory condition of Atchison, Topeka and Santa Fé affairs. On Saturday the bank statement stimulated a rise and the market closed buoyant. On Monday all securities represented in the Richmond Terminal advanced. Stocks were irregular on Tuesday, Richmond Terminal rising on news of the absorption of the Georgia Central system. The movement was less active in the afternoon, but the tone was strong, with Reading, Union Pacific and the grangers leading.

Government bonds were firm and in good demand—quotations as follows:

U. S. 4½s, 1891, registered	108¼
U. S. 4½s, 1891, coupon	108¼
U. S. 4s, 1907, registered	127⅝
U. S. 4s, 1907, coupon	127⅝
U. S. currency 6s	121¼

Commissioner Fink, of the trunk lines, has issued a circular announcing a decided advance in the west-bound rail and lake freight rates from New York to the West. The new rates from New York will go into effect on October 26. The present rates are 35¢ for first-class, and 30, 24, 17, 15 and 13¢ for the other classes downward. The new tariff advances these figures to 51¢ for first-class, and 45, 35, 24, 20 and 17¢ per 100 lb from New York to Chicago for the other classes.

The aggregate clearings of 38 cities during the week show a falling off of 2.8% as compared with the corresponding period last year; outside of New York, however, there was a gain of 12.1%; New York decreased 10.1%; Cincinnati, 5.7%; New Orleans, 0.7%; St. Paul, 15%; Columbus, 6.4%; Wichita, 16.5%; Norfolk, 8.1%; and St. Joseph, 21.1%. Boston increased 19.4%; Philadelphia, 6.9%; Chicago, 9.4%; St. Louis, 8.4%; San Francisco, 41.2%; Pittsburgh, 25.7%; Kansas City, 36.4%; Louisville, 11.8%; Minneapolis, 16.7%; Denver, 16.2%; Detroit, 17.3%; Cleveland, 15.2%.

The weekly bank statement was remarkable as showing an increase of $6,586,000 in the surplus reserve, which now stands at $16,901,025, against $9,363,225 at the corresponding time last year and $5,469,575 in the third week in October, 1886. The explanation is that the heavy bond purchases by the Treasury last week appear on this week's statement. The ability of the banks to meet any further demands that may be made upon them this autumn is not now questioned. Loans were contracted $3,189,600; the specie increased $9,231,300; the legal tenders are down $791,200; the deposits other than United States are increased $7,414,500. Demands from the South for crop purposes continue, while from the West some return shipments are noticed. Rates on time loans, most of which were made by out-of-town institutions, were 3½ to 4½ for three to six months for commercial paper, and rates were 4¾% to 5½% for 60 to 90 days, 5 to 6% for first class four months' commission house names.

The last Treasury statement shows that up to date the Government has purchased under the circular of April 17, $87,454,050 bonds, of which $51,392,000 were 4s and $36,062,050 were 4½s. These $87,454,050 cost $104,905,644. Had they been allowed to run to maturity they would have cost $131,199,036. By their purchase now, even at a premium of $2,838,064 for the 4½s, and $14,613,539 for the 4s, the Government saves on the former $1,850,002; on the 4s, $24,443,138, or a total of $26,293,392.

The posted rates for bankers' sterling are $4.84½ @ $4.85 for 60-day and $4.88½ @ $4.89 for sight. The market is dull and firm. In London the withdrawals of gold are temporarily checked, but Argentine and Russian demands are simply in abeyance, to be renewed at the first opportunity.

The imports of merchandise at this port last week were valued at $8,634,000, of which something over $2,000,000 represents dry goods. Since January 1 the total is $377,640,000, against $380,998,000 for the corresponding period last year and $353,718,000 in 1886. The exports were $5,903,091. Total since Jan. 1, $237,697,000 against $250,442,000 for the same time last year, and $261,830,000 in 1886.

The Empire State Bank, corner of Broadway and Bleecker street, James W. Conrow, president, will soon open for business.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, Oct. 24, 1888.

Speculation in Copper has been very moderate the past week. The selling of futures has dwindled down to small proportions, and the demand for prompts from outside sources is necessarily small. Purchases for consumption have also continued light. In the absence of incentive the syndicate is doing nothing in a speculative way, apart from giving values a certain measure of support. Consumers, it is stated, are no longer bound by cast-iron agreement in making purchases. That is to say, they are now supplied with what Chili Bars they may require, at £78 @ £78. 5/, without giving a guarantee that the Copper will go into consumption. Sales of Copper Furnace Material have again been on a quite extensive scale, but the sellers are more than ordinarily reticent as to terms. Among recent sales Anaconda Matte figures to the extent of 1600 tons, and some 300 tons of American are also reported—all private terms. It is reported that the Rio Tinto Copper Company have signed a new agreement with the French syndicate, giving the latter the control of the company's product for a period of years. The report also has circulation that the negotiations pending with the leading American companies, involving the control of their output for twelve years from the expiration of existing contracts, have been concluded. No particulars are given as to terms, &c. The Bratsberg Company has sold their entire production up to June, 1889, at 13/ per unit.

The market for Block Tin has been very firm, mainly under the influence of continued active buying at the sources of supply. The stock here is still comparatively small and said to be concentrated in few hands.

In the Tin-Plate market there has been a very good business. Buyers and sellers are considerably apart on prices, however, and transactions are restricted to a considerable extent. A large trade is anticipated as soon as prices settle. The Cwmfelin works have added two mills, and now have a total of twelve mills in operation. New mills are being erected by other companies. The wages question is creating more or less uneasiness, and it is stated that the makers are soon to hold a meeting in the interest of concerted action. The masters, it is asserted, have virtually agreed to combine, if their propositions are not accepted, and instantly close down all their works.

The Pig Iron market has been more active, and a variety of influences have come to the surface that tend to strengthen prices more or less. A scarcity of Coal has necessitated the banking up of several Scotch furnaces and thereby reduced the supply. There are also reports of a contemplated combination of Scotch and Cleveland pig makers, presumably to regulate the production. Regarding this alleged combination, nothing definite can be learned at the present time. Scotch Pigs have varied in price only to a very slight degree. Cleveland Pig has weakened a trifle, however, and Hematites, on the other hand, are higher. Freights are showing an easier tendency, more particularly from Glasgow.

Scotch Pig.—The volume of business has been fairly good and prices have ruled very steady.

No. 1 Coltness,	f.o.b.	Glasgow	49/6
No. 1 Summerlee,	"	"	50/9
No. 1 Gartsherrie,	"	"	47/6
No. 1 Langloan,	"	"	49/
No. 1 Carnbroe,	"	"	43/
No. 1 Shotts,	"	at Leith	48/6
No. 1 Glengarnock,	"	Ardrossan	47/6
No. 1 Dalmellington,	"	"	42/6
No. 1 Eglinton,	"	"	41/6

Steamer freights, Glasgow to New York, 6/6 Liverpool to New York, 10/.

Cleveland Pig.—Business has been rather slow and the market is weaker. No. 1 Middlesboro', G.M.B., 37/; No. 3 do., 34/6.

Bessemer Pig.—Trade is showing greater spirit and prices are firmer. West Coast brands, mixed numbers, 45/, f.o.b. shipping point.

Spiegeleisen.—The demand continues very fair and prices remain firm. English 20% quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—There has been a large business and prices show further improvement. Standard English sections quoted at £4, f.o.b. at N. W. England shipping point.

Steel Blooms.—Transactions are moderate, but prices remain firm. We quote £4. 2/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—There continues to be good demand and prices are very firm. Bessemer, 2½ x 2½ inch, £4. 2/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—Transactions in these are moderate, but mainly at firm prices. Bessemer, £4. 2/6, f.o.b. at N. W. England shipping point.

Steel Wire Rods.—The demand moderate, but sellers firm at previous prices. Mild Steel No. 6 quoted at £5. 19/6 @ £6 and No. 5 at £5. 18/6, f.o.b. at N. W. England shipping point.

Scrap Iron.—A moderate business at previous prices. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Old Rails.—Demand very slow; rather more pressure to sell, and prices weaker. Tees quoted at £3. 2/6, and Double Heads £3. 5/, c.i.f. New York.

Crop Ends.—The market quiet and unchanged. Bessemer quoted £2. 7/6 @ £2. 10/, f.o.b.

Tin Plate.—A fair business passing, but prices somewhat irregular. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/9
IC Bessemer steel, Coke finish	14/3 @ 14/6
IC Siemens " "	14/6 @ 14/9
IC Coke, B. V. grade	13/9 @ 14/
Charcoal Terne, Dean grade	12/ @ 12/6

Manufactured Iron.—The market still fairly active, with prices strong. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Ord. Marked Bars				@	8	2	6
" Common "				@	5	5	0
Staff. Bl'k Sheet, singles				@	7	10	0
Welsh Bars (f.o.b. Wales)	4	17	6	@	5	0	0

Tin.—There has been a good business, and the market is strong, particularly for futures. Straits quoted at £102. 10/, spot, and £103 10/ for three months' futures.

Copper.—There is more doing at practically unchanged prices. Chili Bars, £78. 10/, spot, and £78, three months' futures. Best Selected, £81. 10/.

Lead.—The market declined under weight of American advices, but is now firmer. Soft Spanish, £13. 10/.

Spelter.—More business and the market hardening. Silesian, ordinary, £18. 17/6.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds.
Kilogram	2.205
Picul	134.

CHILI.

VALPARAISO, September, 1888.—*Copper*—Has been offered sparingly, yet receded slightly in consequence of the rise in Exchange, from $29.80 ℔ quintal to $29.65, 8273 quintals changing hands at $29.65 @ $29.80, $29.75 equaling £77. 1/9, with 27/6 freight. *Nitrate.*—Some 406,000 quintals were taken at $2.80 @ $2.86, 95 %, October delivery, but none is offered now; 96 % is held at $2.87½; $2.80 equals 8/9 in England, with 30/ freight. Nitrate shipments the first seven months:

	1888. Quintals.	1887. Quintals.	1886. Quintals.
To the North of Europe	5,756,759	4,864,983	3,089,637
To the Mediterranean	103,334	182,938	92,312
To the United States on the Atlantic	899,398	1,001,709	1,087,314
To the United States on the Pacific	113,438	142,296	118,069
Total	6,872,929	6,191,926	4,387,332

Coal.—Quite a tumble has taken place under pressing offers to sell cargoes just arrived, Newcastle declining to 28/ @ 30/ on the spot, and 35/ distant afloats. *Exchange*, 90 days' sight, 26⅝d.—*Weber & Co.*

EAST INDIES.

SINGAPORE, September 5, 1888.—*Tin.*—Our last report was dated 22d ult.; prices have fluctuated since between $34.50 and $37.70, and a fair business has been done. Supplies are now arriving freely. *Tonnage.*—London rates via Canal are firmer at 30/ @ 32/6 for weight. New York via Canal, no space offering. Via Cape, the Gillemeister has taken the berth at 25/ for weight. For Boston the John M. Clerk has been taken up on secret terms. *Exchange* is firm at 3/1⅝ for six months' sight credits.—*Gilfillan, Wood & Co.*

MANILA, October 15, 1888.—*Hemp*—Has been steady during the week at $11.12½, @ $10.25 same time last year, ℔ picul, equaling, cost and freight ℔ ton, £37. 15/, @ £35. 17/6. There cleared for the United States since last cable 11,000 bales, against 7000; since January 1 163,000, against 178,000, and there remain loading 51,000, against 49,000; cleared for England since January 1 268,000 bales, against 175,000 last year; loading for ditto, 11,000, against 4000; cleared for all other countries, 59,000, against 33,000; receipts at all ports since last cable, 24,000, against 13,000, and since January 1, 506,000, against 404,000 in 1887, and 322,000 in 1886. *Freight*, $6, against $5.50; *Exchange*, 3/6½, against 3/8.—*Ker & Co. to Charles Nordhaus, 89 Water street, New York.*

SPAIN

BILBAO, October 6, 1888.—*Iron Ore.*—So far this year the export of Iron Ore from our port has decreased considerably, from 3,422,966 tons to 2,901,544; as at the same time freights by sea had risen very much, it would have been but logical that the price of our Ore should decline. Nothing of the kind has occurred, the fact being that the quality of our Ore is so valuable that neither a lull in the foreign demand nor high freights nor speculation have been able to depress their value. From now forward the scarcity of steamers will terminate; navigation in northern ports will close and many steamers will flock this way, as they usually do in winter, to load Iron ore at Bilbao, being the most profitable occupation in default of something better in other directions, which does not offer at present. What we have said refers to Rubios in particular, worth to-day 7/ @ 7/3. Campanil Ores are even better situated, and their position is stronger from the fact that there are but comparatively few mining companies owning mines producing Campanil Ores, and that this sort enjoys a special demand for Steel making of a superior kind. While there is every probability that Rubios Ores will rise in value with the resumption of greater activity in shipments, the chances are even greater in this respect as regards Campanil, now commanding 8/ @ 8/3. As for steam freights, they have declined a little in the Baltic, but they are higher in the Black Sea ports, where there is a good demand for steamers to load grain and tallow for England at 35/ @ 37/6 ℔ ton and to Bordeaux at 26/. Ore freights hence to Cardiff are 6/1½ @ 6/3, and to Rotterdam, 8/ @ 8/3 ℔ ton; Pig Iron from Bilbao to Ancona in Italy, 15 francs ℔ ton.—*Bilbao Maritimo y Comercial.*

GERMANY.

HAMBURG, October 11, 1888—*Petroleum.*—The tank steamers between the United States and Germany are causing a complete and most important transformation of the Petroleum trade. It was inaugurated by the firm of Riedemann at Geestemunde, near Bremerhafen, in 1885. Till 1885 the whole of Europe was in the habit of importing Petroleum in barrels from America only by sailing vessels, and the empty barrels were shipped back. In 1885 the firm of Riedemann caused one of their sailing vessels to be rebuilt, so as to be a "tank" ship, 72 Iron Tanks being fixed in the hold, filling the same, a cleverly contrived system of pipes connecting them mutually. Into these tanks the Standard Oil Company's Petroleum was pumped, and upon arrival at Geestemunde the contents were transferred to large reservoirs capable of holding 10,000 barrels. Riedemann thereupon caused the steamer Gluckauf to be constructed, the entire hold of which was a tank. Subsequently four additional steamers were built, the Vorwarts, Minister Maybach, Willkommen and Gut Heil. These five steamers have since been conveying annually 120,000 tons of Petroleum of 1000 kg. from the United States to Geestemunde, representing something like 830,000 barrels. The firm now own 15 large Petroleum reservoirs at Geestemunde. Part of the Petroleum is transferred to tank cans, of which the firm own 100, and besides quite a number of German and Swiss Petroleum dealers have caused to be built tank cars of their own, and the firm of Has, at Cassel, have a large reservoir. This trade has grown so much the last few years that at present nine-tenths of Bremen's entire Petroleum importation is received in tank ships, of which one-third goes direct into tank cars; the balance is filled into barrels at Geestemunde. In this item of filling barrels with Petroleum Riedemann also introduced innovations on a gigantic scale. At present he has a stock of empty barrels worth 1,265,000 marks; every day 4000 barrels are turned out. They have a bluish-white color, are lined with glue inside to resist Petroleum, and are filled by an automatic contrivance. The saving in space on board the steamers is such that a tank steamer takes 20,000 to 24,000 barrels of oil in bulk, whereas in barrels only 14,000 could be loaded. The loading of 24,000 barrels takes 60 hours, and the discharging 30 hours. While the leakage on the voyage is 3 to 4 % in barrels, there is none on board tank steamers.—*Borsenhalle.*

Weights of Engines and Boilers per Horse-Power.—In a paper entitled "The First Century of the Marine Engine," presented to the British Institution of Naval Architects, Prof. Henry Dyer refers to the reductions which have been made in recent years in the weights of engines and boilers, and supplies the following interesting table:

	Lbs. per I. H.-P
Merchant steamers	480
Royal navy	360
Engines specially designed for light draft vessels	280
Modern locomotive	140
Torpedo vessels	60
Ordinary marine boilers, including water	196
Locomotive boilers, including water	60

No doubt these figures could be very much reduced if engineers endeavored to make their designs as light as possible; but here the commercial element limits their action, for light engines are always expensive, their high-class workmanship and costly material more than balancing the advantages to be derived from reduced weight.

From the Marquette (Mich.) *Mining Journal*, of the 13th inst., we take the following table, showing the shipments by ports up to date this season, in comparison with shipments for the corresponding portion of the two preceding years:

Port.	1888.	1887.	1886.
Marquette	669,477	697,025	725,942
Escanaba	1,699,611	1,741,042	1,250,717
St. Ignace	97,090	80,654	62,595
Ashland, Wis.	880,268	930,316	612,993
Two Harbors, Minn.	327,439	330,464	264,384
Total	3,673,885	3,779,501	2,916,581

The new port of Yaquina, in Oregon, where a breakwater and other improvements are making by the general Government, is represented as being the finest harbor on the Pacific Coast north of San Francisco. Portland is 110 miles from the ocean and Tacoma and Seattle, the ports of shipment of the Northern Pacific Railroad, have to traverse Puget Sound and the Straits about 180 miles before the ship arrives at the ocean, while it takes only a few minutes to cross the bar at the mouth of Yaquina Bay, when the ocean is reached and the ship is at sea. The appropriation made by Congress this year, it is said, will render this great harbor safe at all seasons, as the water on the bar at low tide at the present time is almost sufficient for vessels of the largest size. Arrangements are now in contemplation for the shipment of grain direct to Europe by the Oregon Pacific Railroad from Yaquina Bay, and the future is so promising that already a large population is concentrated at that locality.

The new armory for the Eighth Regiment, N. G. S. N. Y., about to be erected, will be one of the most artistic and imposing structures of its kind in the city. It will cover a plot of ground on Park avenue 200 x 300 feet, and at each corner will stand a spacious round tower of the baronial style, 50 feet in diameter and 135 feet in hight. The material used is brick, with sandstone trimmings. The main drill-room, 200 feet square, will be on the first floor, together with a large reception-room, a library and the quarters of the officers and the Quartermaster's Department. The ten company-rooms will be on the second floor, and the third will be devoted to a gymnasium, a kitchen and the janitor's apartments. Under the main drill-room will be a 200-foot rifle range. The building will probably be completed by next September. The estimated cost of ground and structure is $660,000. The cornerstone was laid 19th inst. with imposing ceremonies.

Hardware.

As the end of the month approaches there is perhaps a slight falling off in the volume of business, but the general conditions continue as before, with a satisfactory trade and prices that are substantially unchanged. The prospect for a good business during the remainder of the season is generally acknowledged.

Barb Wire.

The demand continues rather moderate and prices have not strengthened, remaining about where they have been. Carload lots of Four-Point Galvanized are quoted at about 3.60 cents, with slight concessions in special cases, and the usual advances for small lots.

Cut Nails.

The New York market remains quiet, without any recovery as yet from the low figures which have prevailed so long. We quote $1.80 to $1.90 for carload lots of Iron Nails from dock, and $1.90 to $2 for small lots from store.

It is reported that some Western makers are naming low figures throughout the territory tributary to this market, and in the East generally, with the object of forcing some understanding among manufacturers by a short, sharp and decisive war.

The unsatisfactory condition of the Western Cut Nail trade has caused one of the largest Nail companies in the country to shut down more than half of their Nail machines, for the first time in their history. They expect to keep them idle throughout the winter. A continuation of present unremunerative prices will probably cause a very decided curtailment in production by other companies, without regard to the action of their competitors in trade.

The Laughlin Nail Company call the attention of the trade to their 3d fine Polished Nails. They are made from plate that has not been pickled, and consequently will not make lathers' mouths sore.

Miscellaneous Prices.

The following are the list prices of McGuire's Star Thimbles, Registers and Ceiling and Register Plates, manufactured by E. C. Stearns & Co., Syracuse, N. Y. The list as given is subject to a discount of 60 per cent.:

McGuire's Star Thimble.

5-inch, 4 to 8 inch extension, per dozen.	$10.00
5-inch, 6 to 12 " " " "	11.00
6-inch, 4 to 8 " " " "	11.00
6-inch, 6 to 12 " " " "	12.00
7-inch, 4 to 8 " " " "	13.00
7-inch, 6 to 12 " " " "	14.00

McGuire's Star Register.

6-inch, 4 to 8 inch extension, per dozen.	$22.75
6-inch, 6 to 12 " " " "	23.75
7-inch, 4 to 8 " " " "	25.75
7-inch, 6 to 12 " " " "	26.75

Ceiling Plate.

5-inch, per dozen Plates	$2.35
6-inch, " " "	2.75
7-inch, " " "	3.25

Register Plate.

6-inch, per dozen Plates	$9.00
7-inch, " " "	9.50

We are advised by the New Haven Copper Company, New Haven, Conn., for whom John H. Graham & Co., are agents, 113 Chambers street, New York, that they are holding their Augers and Bits at higher prices than heretofore, and are giving special attention to the quality of the goods, upon which they are relying to secure the orders of the trade.

From St. Louis our advices are that there is considerable improvement to be noted in the Wire trade, country orders coming in more freely and mills being gradually worked up to their capacity. The demand for the cheaper grades of Wire is not, however, at the present time very large. The Freeman Wire Company, St. Louis, quote as follows:

Barb, Two and Four Point, Painted,	$2.95 to $3.10
Barb, Two and Four Point, Galvanized,	60 to 75 cents advance.
Nos. 6 to 9, Annealed	2.35 to 2.40
Nos. 10 to 11, "	2.45 to 2.50
No. 12, "	2.55 to 2.60
No. 13, "	2.70 to 2.75
Galvanized, 60 cents advance.	
No. 14	2.85 to 2.90
No. 15	3.15 to 3.20
No. 16	3.25 to 3.30
Galvanized, 75 cents advance.	

The Solitaire Coffee Urn, manufactured by the Chas. F. Henis Company, Philadelphia, Pa., for whom Samuel A. Haines, 90 Chambers street, New York, is agent, is quoted to the general trade at $2.50 per dozen.

Owing to the present condition of the Lead market Solder is unsettled, and there is some diversity in the quotations made by leading manufacturers, No. 1 being quoted at from 12 to 13 cents, and Half-and-Half from 13½ to 14½ cents. The market is characterized by a rather weak tone.

The trade will observe the illustrations, given on page 646, of the Arcade Revolving Bench Plate, which is patented and put on the market by Frank E. Thompson, Elkhart, Ind. The utility of this device for holding Tinners' and Metal-Workers' Tools, Stakes, &c., will be at once perceived. A circular is issued by Mr. Thompson in which a full description is given of the article, and among other points which are mentioned is that twice the number of men can work at a bench with such a Bench Plate than at one without it. The Bench Plate is sold at $2.50, f.o.b. cars Elkhart, no charge for box or cartage. Its shipping weight is 40 pounds.

The following quotations are made by the Nickel Plate Stove Polish Company, Chicago, Ill.:

Black Eagle Benzine Paste, 5 and 10 lb. cans.	12½¢
Black Jack Water Paste, 5 and 10 lb. cans.	12½¢
Nickel Plate Paste, ¼ and ½ gross boxes, per gross	$6.00

In Machine Bolts, in which there has of late been a good deal of irregularity, a somewhat better condition is said to prevail, prices being a little stiffer.

The combination on Common Carriage Bolts continues to work quite satisfactorily, but there are some indications of slight irregularities, in which, in a covert way, some of its provisions are evaded.

The market on Steel Goods is in a very satisfactory condition, and orders are being freely placed by the jobbers. The confidence that exists in the stability of the arrangement, and the fact that stocks were very much depleted at the close of the last season, have the result of making these orders liberal, covering large quantities.

The Screw market continues without change, and the combination prices are well maintained by the associated manufacturers. The Charles Parker Company, who are outside, are making small concessions in price.

No change in Manila Rope has yet been announced, but the condition of the market is such as to give reason to expect that an advance may be made before long. Sisal also is reported as decidedly firm.

As a consequence of the condition of the Lead market, Shot, Sheet Lead, &c., are in an unsettled state, and prices lately ruling are nominal.

E. M. Richardson, Waltham, Mass., is now putting up Shedd's Fasts in paper boxes containing 10 sets, with 100 to 500 sets in a case. No change has been made in the price.

Trade Topics.

From California we have received the following complaint in regard to Plumbs and Levels. It is to be hoped that the experience to which our correspondent refers is exceptional and does not indicate the general quality of the goods in question:

If you have any room in your valuable paper you will confer a favor on the trade generally by drawing the attention of manufacturers of Levels to an injustice they do retail dealers by sending out goods that are not correct. A few days ago a buyer came in to purchase a Level. We showed him samples and he chose one which we sell for $3.25. Of course when a man pays that price he wants to see if it is accurate, and on going over 18 of this quality we did not find one that was correct as a Level, to say nothing of the Plumb, and, of course, we did not make a sale. The next day we started one of the clerks to go over the whole stock, and in 117 Levels we found the following result:

Correct in Level and Plumb	0
Plumbs correct	7
Levels correct	3

We tried Levels that cost from $4 to $30 per dozen. We think manufacturers ought to be able to make the tools correct, and no doubt they would if a few retailers would kick.

A few manufacturers are issuing both net prices and quotations by list and discount. We are advised by one of these, a well-known manufacturing concern of the West, that some merchants prefer net prices on account of the convenience in not having to figure the discount, thus saving work in marking goods. Most of the trade, especially among the larger buyers, prefer the list and discount, as this method is much simpler and easier in purchasing the goods.

Items.

The Goulds Mfg. Company, Seneca Falls, N. Y., and 60 Barclay street, New York, have issued a new catalogue of their varied line of Pumps, Engines, Rams and Hydraulic Machinery. It is a volume of nearly 300 pages, compactly arranged, fully illustrated, and of unique typographical design. The front cover is represented in miniature in their advertisement on page 36. An interesting feature of the book, the utility of which will be appreciated by intending purchasers, is the many excellent illustrations of their goods in operation. An interesting department of the book is that devoted to a description of the manufacturing of their goods, and many illustrations are given representing the different departments of their factory and the various stages in the production of the goods. In addition to their line, with which the trade is familiar, a number of new goods are represented.

The F. B. Harkins Foundry Company, Bristol, Conn., manufacturers of a line of Cooking Ranges of several sizes, are also making a line of Stove Hollow-Ware and fine Gray Iron Castings, which are referred to as excelling in their smoothness of finish, special reference being made to their Unground Spiders. Mr. Harkins, the president of the company, has invented and secured patents upon a Molding Machine which may be used for the production of small work of various kinds, but is especially adapted for use in making Sash Weights. The Weights are referred to as in regularity and smoothness of surface superior to others in the market, and are sold at about the same price.

H. H. & C. L. Munger, manufacturers' agents for Hardware specialties, at 142 Lake street, Chicago, have been appointed Western agents for the Brinkrehoff Company's Crown Picture-Hanger, which was illustrated in our columns on the 4th inst. They will carry a full stock, so as to be

able to make prompt shipments. They have also recently received samples of Lawson's Patent Revolving Shelf Showcase, for which they are sales agents. A new addition to their stock is a line of the Phœnix Bench Anvils, made by the Moore & Barnes Mfg. Company, for amateurs, jewelers, &c. They state that they are again well supplied with the Patent Fiber Head Mallets, the manufacture of which had been curtailed by the burning of the factory. These mallets have vulcanized fiber heads, pressed on under 200 tons pressure, which have been found equal to leather heads for mechanical purposes, and superior to them in durability.

It will be observed on page 59 that the E. C. Meacham Arms Company, St. Louis, Mo., call attention to some new Guns, somewhat shopworn, which they are offering at special prices.

The Hartman Mfg. Company, Beaver Falls, Pa., have established a Western sales agency in the First National Bank Building, Chicago, under charge of S. T. Hastie, for the sale of their Steel Picket Fence. They make both ornamental fences for lawns and field fences for farm purposes. It is not a netting, but a substantial fence.

A. G. Newman, successor to Newman & Capron, 1180 Broadway, with factory at 157 to 163 West Twenty-ninth street, New York, has issued a very fine illustrated catalogue of Builders' Hardware, including Locks, Knobs, Sash Fasts, Handles, Bolts, Hooks, Hinges, Sheaves, Electric Bell Material, &c., all of which are represented in an attractive style, many tasty patterns being displayed. In their introductory address to their patrons they refer to the fact that the standard of artistic Hardware has been raised by the efforts of the architect and persons of taste, who have demanded of the Hardware manufacturer that the articles produced shall be in the highest style of the art, and it is to meet the demand for goods of this kind that the line represented in the catalogue is offered. The styles of finish applied to the goods shown in the volume are polished, light bronzed, light statuary, statuary or dark bronze, verde-antique, oxidized silver and gold-plated. This volume will be of especial value to architects and builders, for whom it is particularly designed.

The Freeport Hardware Mfg. Company, of Freeport, Ill., moved into their new office and warehouse last week. When the improvements now under way are completed they will occupy a space 88 by 150 feet. About half of this tract is now covered with a frame building, which is three stories high in front and two stories in the rear, running back to the railroad tracks for the purpose of securing good shipping facilities. The front part of the remainder of the tract is covered with the office building, and the rear will soon be occupied by another building which is under construction. The company manufacture a line of Hardware specialties, embracing the Wiles Spring Hinge, the Devore Spring Hinge, the Imperial Spring Hinge, the Warner Spring Hinge, Devore's Door Spring, Devore's Indestructible Awl, Linsley's Hobson's Choice Screw-Driver, the Wonder Cork Extractor, and Linsley's Box Opener or Nail Puller. They do not operate a foundry, but have their castings made by other establishments, and employ a force of workmen to put the various parts together. They have issued a neat catalogue of their specialties, illustrating and describing them, and setting forth their special merits.

The Eastern Tinware Company, Portland, Conn., announce that they have purchased the plant of the United States Stamping Company, at Portland, Conn., where they will continue the manufacture of the goods. They have given Joseph Scheider & Co., 103 to 109 North Third street, Brooklyn, E. D., N. Y., the exclusive agency for their entire production. Referring to the above Joseph Scheider & Co. allude to the extensive line of goods which they manufacture in Brooklyn, together with the production of the Eastern Tinware Company, as enabling them to supply the trade with a full line of Tinware.

Seymour Mfg. Company, St. Louis, Mo., have issued a tasty catalogue of their Grain Cradles, Scythe Snaths and Spokes, 1888-89. The pamphlet is printed on superior paper and excellent illustrations are given of the different goods.

A sale of Hardware, on account of fire underwriters, takes place on the 24th inst. at 200 to 206 Madison street, Chicago. The goods are the salvage of Cutler, Woodrough & Co., 19 Lake street, and consist of 600 cases of Lock, Knobs, Latches, Casters, &c., and 200 cases of the Pioneer Lock Company's Hinges, Pins, Joints, Flat Irons, &c. They were slightly damaged by water in extinguishing a fire on the adjoining premises.

The Rogers & Hamilton Company, Waterbury, Conn., issue pages describing new patterns of goods which they are putting upon the market in tasty satin-lined boxes or cases especially designed for the fall trade. One of these refers to their Normandie pattern in old silver and illustrates a Pie Knife. An earlier issue shows their No. 133 Combination Set.

The Coleman Hardware Company, 55 Dearborn street, Chicago, and Morris, Ill., have issued a price list showing their Hardware specialties. It represents the Nickel Hangers and Rail, the J. G. C. Hanger, Nickel Spring Hinge, J. G. C. Spring Hinge, Nickel Stay Roller, Nickel Farm Gate and Shumard Sash Balance.

Joshua Britton & Son, Stoughton, Mass., have made a decided improvement in their Henry's Patent Combination Haft, of which they are manufacturers, and which they are now putting more prominently on the market. This Tool Holder, which is illustrated in their advertisement on page 58, carries the tools in the end of the holder in which they are used, so that when the tool is opened all the tools contained in it are in view with their points up, thus fascilitating greatly the selection of the one wanted. The principal improvement which has been made is in the cap or sleeve, which is now made of brass nickel plated, instead of hard rubber, as heretofore. The tool is thus rendered much more durable, while at the same time it is given a handsomer appearance. The handle is made of rosewood. Other points made in regard to it are: That the same motion that unscrews the instrument removes the cap that covers the surplus tools; that no wrench is required and that the tool has a solid handle and can be used with a mallet.

C. & W. McClean, St. Louis, Mo., have issued their No. 700 illustrated catalogue, which contains nearly 100 pages, which are devoted to an exhibition of their line of Fishing Nets and Tackle, Guns, Sporting Implements, &c. An interesting line of Nets, which are not usually found in such publications, is given a prominent place, while Fish Hooks, Rods in large variety, Rod Fittings, Reels, Spoons, &c., are fully represented, with many specialties in this line. Traps, Guns, Gun Implements and miscellaneous Sporting Goods are also illustrated. The catalogue closes with a complete index.

Hibbard, Spencer, Bartlett & Co, Chicago, Ill., have issued, October 12, a 40-page catalogue of seasonable and staple goods. Skates, Sleigh Bells, Hand Sleighs and Snow Shovels are given a prominent place, with a variety of other goods, including an extensive line of Clocks.

W. C. Burkinshaw has opened an office at 83 John street, New York, in which he will conduct the business of commission merchant and importer of Hardware. He has made arrangements with James Deakin & Sons, Sheffield, England, for the sole agency of their goods in the United States, and is prepared to execute orders for Ivory and Celluloid Table Cutlery, Stag Carvers, Pearl Dessert Knives, &c. In addition to the above Mr. Burkinshaw is prepared to receive orders for the exportation of American goods, and offers for sale here a line of fancy articles suitable for the jewelry and notion business.

A copy of the Colorado *Exchange Journal* for October 6 has reached us. It contains a great variety of matter, historical, biographical and industrial, relating to the City of Pueblo, accompanied with profuse illustrations. Among the engravings are a portrait of Guy T. Nash and a view of the building of the Pueblo Hardware Company, of which he is secretary and treasurer. From the biographical sketch in connection with the portrait we learn that Mr. Nash was born in Vermont in 1842, was a member of the Twelfth Vermont Regiment during the war, migrated to Iowa in 1870, went into the Hardware business at Fort Dodge and subsequently at Humboldt, and removed to Pueblo in 1885. The Pueblo Hardware Company are stated to be greatly increasing their business under his management, and their field enlarges as the territory tributary to Pueblo is widened by the rapid extension of railroad facilities.

The Miller Lock Company, Philadelphia, Pa., have issued their catalogue No. 8, which is devoted to an exhibition of their line of Champion Locks, of which full descriptions and illustrations are given. The extent of the line of Keyless Locks and the advances the company are making in this direction are to be noticed. They advise us that during the season just past the Young Men's Christian Association in this city secured an outfit of these Locks for its gymnasium lockers, and that other important orders are in hand, with a growing demand both home and export.

The American Machine Company, Philadelphia, Pa., for whom John H. Graham & Co., 113 Chambers street, New York, are agents, have issued a neat descriptive catalogue of the Crown Meat Cutter, of which we gave an illustrated description a few weeks ago. The catalogue explains the construction and operation of the machine, and gives testimonials in regard to its use, and a number of recipes for dishes, in the preparation of which it may be used. They also send out a unique and effective colored lithographic advertising card, which is utilized in calling attention to the machine.

Buhl, Sons & Co., Detroit, Mich., announce that they have admitted Charles H. Jacobs as a member of their firm, dating from August 1, 1888.

McIntosh, Huntington & Co., Cleveland, Ohio, have issued their winter circular of seasonable goods and specialties. It relates to Skates, Children's Sleighs, Toy Banks, Carvers, Registers, Foot Warmers, Lanterns, Snow Shovels, &c.

The Detroit Copper and Brass Rolling Mills, Detroit, Mich., of which C. H. Buhl is president, R. W. Gillet, vice-president, and L. H. Jones, secretary, have issued a convenient price list of their manufactures, in which pains have been taken to make the typographical arrangement such as to facilitate its use. They call attention to the completion of their new factory and their facilities for filling orders promptly.

In an article in regard to protection against polluted water, a recent issue of the *Sanitarian*, referring to the importance of Filters and alluding to some of the methods on which they have been constructed, says:

Porous stone, both natural and artificial, of various degrees of texture, has been extensively used in recent years, and with greatly improved results. Of such, in particular, is the Gate City Stone Filter, which uses a natural stone. It is put up in several varieties—china, glass and stone—and we are satisfied, from personal observation, that it comprehends the best requirements. Professor J. J. Browne, of Syracuse University, Syracuse, N. Y., after using one continuously in his laboratory for several months, writes: "I have thoroughly tested it. The foulest water I could obtain was first passed through the filter, and afterward examined with the microscope at intervals for a number of days without detecting the least trace of animalcule. Its decolorizing power is easily shown by filtering ink, iodide of starch, iodide of mercury, &c. I think that many who have witnessed these experiments are convinced that it has no equal. The ease with which it is cleansed (so obvious to all) is superior to every Filter of which I have any knowledge.

The Filter referred to will be recognized as that of the Gate City Stone Filter Company, 46 Murray street, New York, who manufacture, it will be remembered, a large variety of patterns, in most of which the ice used for cooling the water is kept in a separate chamber, thus preventing any contamination from that source.

The Pony Hand Elevator.

In connection with the description of the elevator which was given in our last issue, our attention has been called to the Humphrey Pony Hand Elevator, manufactured by the Edward Storm Spring Company, Poughkeepsie, N. Y., for whom John H. Graham & Co., 113 Chambers street, New York, are agents. The need of such an elevator as was described in our last issue led to the putting of the Pony Hand Elevator on the market, and it is regarded as meeting the needs of the trade and giving an elevator with a capacity of 500 pounds at a moderate expense. In the advertisement of the company on page 85 an illustration is given showing its arrangement, and its comparative inexpensiveness is evident when it is remembered that the price of the fixtures is $36 per set, with a discount to the trade of 15 per cent. We are also advised that, when desired, the company will furnish the fixtures, fastened to a 1½-inch shelf, to fit exactly the top of well hole, at an extra cost of from $2.50 to $4, net, according to size. In such case, it is necessary for purchasers to give the size of the well hole, inside measurement. In connection with their catalogue, giving full description of this machine, the company send out a number of certificates from parties who have used them, and among them are several Hardware houses.

Tendencies in Trade.

We have received a number of letters from Hardware houses in different parts of the country with reference to the position of the wholesale houses and the question as to whether or not their business is being undermined on account of an increase in direct dealings between the manufacturers and the smaller trade. Referring to this matter a well-informed Hardwareman of Colorado writes as follows:

The last two years have shown the manufacturer and consumer getting nearer all the time. Any one acquainted with New York and Chicago, and visiting both places, cannot have failed to notice that the signs on Lake street, Chicago, are duplicating each year more and more the manufacturers' signs on Chambers street, New York. From simple agencies in Chicago, taking orders to be filled from factory, stocks are now carried in Chicago by manufacturers, and, what is more, we can buy many goods from manufacturers as cheaply in Chicago as in New York. The jobber seems to be going West, and to-day the Missouri River jobbers are selling many goods as cheaply as those in Chicago and St. Louis. To us these things all appear to be straws, showing the way of the wind. I do not doubt, however, that the jobbing business is on the increase, because population is increasing, but I do not think it is in the same proportion.

We have also received the following careful review of the situation from a prominent Hardware merchant in Iowa, whose views in regard to the tendencies of trade are entitled to careful attention:

Our experience is that the great majority of Hardware retailers buy from the jobbers and not from the manufacturers. A few of the largest retailers probably buy East from certain manufacturers, or manufacturers and jobbers combined, who make it a point to solicit the business of this class of trade. The history of the jobbing Hardware trade from New York City west points to the fact that a jobbing center is a necessity every 200 miles at least. Notwithstanding the heroic efforts made by Chicago and St. Louis jobbers to corral the entire trade west of them, these smaller jobbing centers every 200 miles or less have continued to grow, flourish and increase. Retail Hardware dealers do not carry nowadays anywhere near the stock they formerly did when forced to buy from distant markets. This decided advantage is appreciated and accepted now as a necessity by the trade generally. Hence the establishment of supply-houses at convenient distances. Owing to the rapid increase and importance of jobbing centers throughout the more populous portions of the West, we find that jobbers located in the two largest Western centers have been forced to seek for trade in the extreme West, and to-day their heaviest trade comes from these sections, where no convenient supply-houses have as yet been established. To still further increase their sales new and varied lines of goods, foreign to Hardware, have been added to their stocks. This would not have been necessary had not their sales of Hardware been curtailed to a serious extent by the numerous jobbing centers that have sprung up and monopolized trade formerly purchasing their supplies from the two cities referred to.

It is not unreasonable to believe that the history of the jobbing Hardware trade of New York City will repeat itself as far as Chicago is concerned. We regard it as simply the natural course of events. Already a large number of prominent manufacturers are represented in Chicago, many of them carrying a full stock of goods there. When this becomes general we predict that the business of the West (as far as jobbing Hardware is concerned) will be done by the manufacturers' branch houses in Chicago, mainly through, and by means of, these jobbing centers scattered throughout the country at convenient distances. At present there is a severe fight for trade, and, possibly, existence. We think the remedy is with the manufacturers, who seem to be slow in appreciating the situation.

A house in Ohio compares as follows their experience with that of F. B. Straub & Co., the table of whose purchases was published in our issue, 11th inst.:

Regarding the subject in question we are very strongly of the opinion that the Hardware merchant of this section at least is buying his goods more generally from manufacturers (or their agents) than from jobbers, and that the effort of the retail Hardwareman is now, as it has been for years past, to get nearer the manufacturer in his dealings. Our own experience has been that in the years from 1870 to 1875 nearly 75 per cent. of our purchases were from jobbers, two-thirds of whom were Western, of our own locality. Since that period our purchases from jobbers have gradually declined and those from manufacturers proportionately increased, until in the last five years the average percentages have nearly reversed. As between Western and Eastern manufacturers, our purchases are gradually working in favor of Western.

From a wholesale house in Minnesota we have the following review of the situation:

We have noticed the article in *The Iron Age* of Fred. P. Straub & Co., to which you refer, and, while in our own experience we have not the matter so accurately tabulated as the above firm, yet we have observed a tendency in the direction indicated by their table. We think this arises, perhaps, more from the fact that manufacturers are soliciting the general trade more than formerly, rather than that the trade are looking after the manufacturers. Many small manufactories are being established over the country, and, usually, they introduce their goods by going to the general trade. The jobbing trade is also being distributed over the country, and not concentrated in New York, Chicago, St. Louis and other large cities, as formerly, in our opinion.

A well-known house in Michigan in the following letter refer especially to the importance of the jobber as a distributor to the retail trade:

Our experience is that, with proper manipulation, we are able to get fully as good terms and prices from Hardware jobbers as from manufacturers. Large manufacturers especially protect and favor jobbers to such an extent that we can get fully as favorable quotations from them as from the manufacturers, and, while this state of things continues, we feel inclined to give the jobber the preference. The jobbing institutions of the country are a necessity, and, with the majority of the retail dealers, cannot be dispensed with.

Referring to the general question a Hardwareman in Iowa writes as follows:

There exists to-day a tendency on the part of retailers through the West to buy of jobbers, for the reason that the jobbers will meet any prices quoted by the manufacturers. Again, the retailers are lightly stocked and find it convenient to assort up with large jobbing houses. My impression is that the big jobber has got the manufacturer by the throat and compels him to sell at his own offer, just as the bondholder has Uncle Sam by the throat and makes him come down handsomely.

A Kansas Hardwareman refers as follows to purchases from manufacturers and jobbers:

In my opinion there is a steady increase in trade between retail dealers and manufacturers where the retailer is so situated that he can pay spot cash and does enough business to warrant his buying in large quantities and original packages. Location has much to do with this trade, as a Western retailer can better afford to buy from a Western jobber than from an Eastern manufacturer on account of getting his goods quicker, while with Eastern retailers, I should judge, the most of their trade would be with manufacturers. A Western manufacturer who gave the retailer the benefit of the jobber's profit would, in my opinion, get the bulk of the Western trade, even on spot cash basis.

FIRST PRIZE LIST IN CIPHER COMPETITION.

The following is the list of ten-letter words which secured the first prize in this competition, the list being that submitted by C. F. Rood, of Grand Rapids, Mich.

Abjunctive
Abridgment
Absorptive
Absumption
Adjunctive
Admonisher
Afterglows
Agrypnotis
Albuminose
Alcyoniums
Alpenstock
Ambilevous
Ambrotypes
Amphoteric
Amurcosity
Angiosperm
Angulosity
Antichlors
Armslength
Apothecium
Avouchment
Backfriend
Backslider
Bankcredit
Bankruptcy
Banstickle
Batfowling
Beadleship
Becomingly
Bewitchful
Bichromate
Bifurcated
Binoculate
Bipetalous
Birdsmouth
Birthplace
Bisulphate
Blacksmith
Blackthorn
Blackstone
Bladesmith
Blandisher
Blastoderm
Blockhouse
Blustering
Boastingly
Bolstering
Bondtimber
Bountyhead
Boxhauling
Brachydome
Bracketing
Breastplow
Bridlepath
Brightsome
Brownstudy
Bucholzite
Butchering
Butlership
Calmbrowed
Caloriduct
Censurably
Centiloquy
Centralism
Chalkstone
Charmingly
Cheatingly
Cherubical
Chevrotain
Chiefbaron
Chimneypot
Chiroplast
Chivalrous
Chloridate
Choriambus
Chromatype
Chrysolite
Cismontane
Claspknife
Clinometry
Clothespin
Clogdances
Clubfisted
Clustering

Clypeiform
Coadjument
Coadjuting
Coadjutive
Codfishery
Coequality
Cogitabund
Cognizable
Cognizably
Columnated
Combshaped
Compatible
Compatibly
Complainer
Complaints
Complexity
Completing
Compulsive
Computable
Confusable
Confusedly
Confutable
Conjugated
Conjugates
Conspiracy
Consultary
Consultive
Consumable
Copulative
Cornfields
Corymbiate
Courtlands
Covetingly
Cowardship
Creditably
Crustalogy
Culminated
Curtaildog
Cushewbird
Customable
Customably
Cyathiform
Cymiferous
Dairyhouse
Daughterly
Deaconship
Dearbought
Debasingly
Debatingly
Debonairly
Decagynous
Decimators
Declinator
Decorating
Decubation
Defacingly
Defamingly
Defaulting
Deflouring
Defluxions
Deforciant
Defrauding
Delightous
Demigroat
Dentiloquy
Dentiscalp
Depilatory
Depositary
Designator
Despairful
Despicably
Despotical
Destinably
Dialectors
Dichromate
Diplomates
Diptychums
Disaugment
Disburgeon
Discounter
Discourage
Discrepant
Disculpate
Disencharm

Disgruntle
Disharmony
Dispatcher
Disputable
Disulphate
Ditrochean
Divulgates
Divulgater
Dithyrambs
Dockmaster
Doctrinals
Documental
Dogfancier
Dogwatches
Dogmatizes
Dogmatizer
Dolphinets
Domestical
Dragonfish
Dragonlike
Drayplough
Drinkables
Dreamingly
Doublestar
Doubtingly
Drawgloves
Droptables
Droplights
Dumpingcar
Dulcorates
Dumbwaiter
Duplicates
Dwarfishly
Dynamiters
Earthbound
Edaciously
Educations
Edulcorant
Eidographs
Ejulations
Elbowchair
Elucidator
Eluxations
Emblazonry
Emulations
Emuscation
Endorhizal
Engarboils
Epistolary
Epulations
Exhaustion
Equivocals
Euharmonic
Euphonical
Euphorbial
Euphoniads
Eutychians
Evulgation
Excubation
Excubatory
Excusatory
Exhausting
Expansibly
Explicator
Exsudation
Exudations
Fabulosity
Factioners
Factiously
Factorship
Factorings
Fahlunites
Factorizes
Factorized
Fairspoken
Fanblowers
Farsighted
Favoringly
Fairystone
Faldistory
Falterings
Faulchions
Febriculas
Februation

Felspathic
Fieldsport
Fieldworks
Figurantes
Figurately
Feltgrains
Fingerpost
Fishmarket
Fishmonger
Fishtrowel
Fishtackle
Fisherboat
Fishertown
Fivescourt
Flamineous
Flamingoes
Fleshwound
Flourished
Flowerbuds
Flowerings
Flunkeydom
Fluohydric
Flustering
Fluxations
Flyingcamp
Flyingshot
Fluxionary
Flypowders
Foliatures
Fogwhistle
Forcipated
Forecabins
Forensical
Foreshadow
Forgivable
Forinsecal
Forethinks
Formalized
Formalizes
Formatives
Formidable
Formidably
Formulates
Formulated
Fornicated
Fornicates
Formulized
Formulizes
Forshaping
Fortalices
Fortilages
Fortunized
Fortunizes
Fosterling
Foxhunters
Franchised
Freakishly
Freightcar
Frolicsome
Fulciments
Fulminated
Fulminates
Fumatories
Fumigatory
Furcations
Furzechats
Gardenplot
Gardenship
Gasfixture
Gasometric
Gazehounds
Gelatinous
Gerfalcons
Girandoles
Glandiform
Glauconite
Glochidate
Gnatflower
Goatmilker
Goatsucker
Godfathers
Goldencups
Goldenfish
Gormandize

Graciously
Grainmoths
Gramineous
Grandevity
Grandevous
Granulites
Gravelpits
Grapholite
Grayhounds
Greyhounds
Grievously
Groundbait
Groundbase
Growtheads
Guineafowl
Guineaworm
Gulfstream
Gunpowders
Guntackles
Gynarchies
Gyrfalcons
Hacquetons
Hairgloves
Halfprices
Halfrounds
Halftongue
Handiworks
Handsomely
Handygripe
Handyworks
Harlequins
Harmonites
Harmonized
Harmonizes
Harvestbug
Harvestfly
Hawseblock
Headblocks
Headspring
Headstrong
Heartbonds
Heartlings
Hectograms
Hemicranys
Hemidactyl
Hemitropal
Herdswoman
Hexagynous
Hexandrous
Hieromancy
Hindermost
Hogpeanuts
Holingaxes
Holystoned
Honeystalk
Hortensial
Hospitaler
Hospitable
Hospitably
Hotbrained
Hourangles
Hourplates
Humanizers
Humblecows
Humoralist
Humpbacked
Hyalotypes
Hydrations
Hydraulics
Hydromancy
Hydropical
Hydrotical
Hydropults
Hyemations
Hyperbatic
Hyperbaton
Hyperbolas
Hyperbolic
Hyperdulia
Hyperoxids
Hypnotized
Hypnotizes
Hyprotizer
Hypodermic

Ideography
Inchoately
Incompared
Incubatory
Inculpated
Inculpates
Incurables
Incurvated
Incurvates
Indevoutly
Indorsable
Indraughts
Inexorably
Infamously
Infuscated
Ingrateful
Ingustable
Inoculated
Inoculates
Inosculate
Intercloud
Interlocks
Interplays
Interposal
Intershock
Introduces
Introsumed
Involucred
Involucret
Isothermal
Ivoryblack
Ivymantled
Jackfruits
Jacktimber
Jacktowels
Jauntycars
Jeoparding
Jerfalcons
Jockeyship
Journalism
Journalist
Journalize
Judicatory
Kalsomined
Kalsominer
Kaligenous
Karpholite
Kentishrag
Kampylites
Kidneyform
Kidneywort
Kingcrafts
Kingtables
Knifetrays
Knifeboard
Labyrinths
Lachrymose
Lacquering
Lactifuges
Ladycourts
Lady'sbower
Ladyfinger
Lambrequin
Lampyrines
Landforces
Languished
Languisher
Laniferous
Lanigerous
Lapjointed
Lathbricks
Lavishment
Lawmongers
Lectionary
Lengthways
Leucopathy
Lexigraphy
Liefraught
Lifeguards
Lighterman
Limehounds
Lithocarps
Lithomancy
Lithomarge

Logarithms
Longimetry
Longitudes
Lovetricks
Locustbean
Lubricants
Lubricated
Lubricates
Lucratives
Lupinaster
Lurcations
Lychnobite
Lympheduct
Mackintosh
Magnitudes
Mailroutes
Mangobirds
Manichords
Manifestly
Mantichors
Manuscript
Marketings
Mashing tub
Matronizes
Matronized
Mayflowers
Meadowpink
Mechanurgy
Megalornis
Megaphyton
Mendacious
Merchantly
Meropidans
Metaphoric
Metaphysic
Methodical
Micropyles
Microphyte
Mineralogy
Mintjuleps
Minutejack
Mischarged
Miscounted
Misexpound
Misfortune
Misgrafted
Mistakenly
Mistflower
Misvouched
Miswrought
Mockprivet
Moderating
Modulating
Monkeypats
Mouldering
Mouldwarps
Molybdates
Molybderas
Monarchist
Monarchies
Monarchize
Monkeycups
Monkeyrail
Monkeytail
Monradites
Monticules
Mordicants
Mortalized
Mortalizes
Motherings
Musicalbox
Mucronated
Mucronates
Multifaced
Muscardine
Myographic
Narcotized
Narcotizes
Navelworts
Navigerous
Nebulosity
Neckcloths
Neckmoulds
Neighborly

Neoplastic
Neuroglias
Neuropathy
Nightcrows
Nightmares
Nightrules
Nightwalks
Noctuaries
Noticeably
Nucleiform
Numerosity
Nursechild
Obduracies
Obdurately
Obdurating
Obfirmated
Obfirmates
Obfuscated
Objurgated
Observancy
Obsignated
Omnigraphs
Omphazites
Opalescing
Optigraphs
Orangemusk
Orbiculate
Ordinately
Orphalines
Osculating
Osculatrix
Ostracized
Outblazing
Outbraving
Outbraying
Outbrazens
Outclimbed
Outdrawing
Outflanked
Outflashed
Outlandish
Outlaughed
Outlawries
Outleaping
Outmarched
Outpraying
Outrivaled
Outsparkle
Outwalking
Outwearing
Overacting
Overbuilds
Overbuying
Overdating
Overflying
Overgazing
Overlading
Overlaving
Overlavish
Overlaying
Overlights
Overnights
Overpaints
Overpaying
Overplying
Overslaugh
Overslight
Overtaking
Overtaxing
Overwaxing
Oxymuriate
Pachyderms
Packetship
Padlocking
Palindrome
Panegyrist
Panegyrics
Panelworks
Parbuckles
Parbuckled
Parcelings
Parchingly
Parchments
Parheliums
Parhelions
Parvitudes
Pastorling
Patchingly
Pathogenic
Patronized
Patronizes
Patronymic
Peculating
Paintboxes
Pathfinder
Peculation
Peculators
Pedanticly
Pedimanous
Pentachord
Pentroughs
Penultimas
Perflating
Perflation
Perigynous
Perilymphs
Perishably
Permutably
Persolving
Personalty
Persuading
Petaliform
Phenogamic
Philomaths
Philomathy
Phlegmatic
Pholadites
Phylacters
Phycomater
Physograde
Phytochimy
Picturable
Pigmentary
Pigmentous
Pilotbread
Pilotjacks
Pinacloths
Pinksaucer
Pitchforks
Pitchworks
Placoderms
Plaguespot
Plainworks
Planetoids
Planimetry
Plastering
Platonized
Platonizes
Platyrhine
Plauditory
Playground
Playthings
Playwright
Pleonastic
Plicatures
Plumbagine
Pneumatics
Pocketfuls
Pocketlids
Polyanthus
Polarchies
Polianthes
Polishment
Polybasite
Polychrest
Polygamist
Polyganize
Polygamies
Polygraphs
Polygenist
Polymathic
Polymnites
Polytheism
Porcelains
Portglaves
Postmarked
Pothangers
Poundcakes
Poundrates
Practively
Pratincole
Preambling
Precations
Precaution
Preciously
Precluding
Preclusion
Predations
Predicants
Prejudical
Prelations
Preobtains
Presbyopic
Presbyopia
Prestimony
Presumably
Previously
Pricklouse
Pricklyash
Prickshaft
Princedoms
Prizecourt
Proclaimed
Procumbent
Producents
Producible
Productile
Productive
Profitable
Profitably
Profulgent
Profundity
Projecting
Prolapsing
Proleptics
Promulgate
Prongbucks
Procenium
Provencial
Prudential
Prytaneums
Psalmodize
Psychiater
Pulmograde
Punchbowls
Punctiform
Punishable
Purchasing
Purgaments
Purgations
Purgatives
Quachiltos
Quamoclits
Quartzoids
Quatrefoil
Quayberths
Quincewort
Rantipoles
Ravenously
Ravensduck
Ravishment
Readingboy
Readopting
Rebukingly
Recaptions
Reclasping
Reconfirms
Recoursing
Recubation
Recusation
Redactions
Redoubling
Redoubting
Reductions
Regulation
Reimplants
Relocating
Remolding
Replicants
Republican
Resaluting
Resudation
Resumption
Revictuals
Revocating
Revokingly
Rheumatics
Rhumblines
Ridgebands
Robinwakes
Rochealums
Rockplants
Roundelays
Rudimental
Rudolphine
Rushcandle
Safetyplug
Sandmyrtle
Sardonicly
Scampering
Schemingly
Scherzando
Scholarity
Sciography
Scrambling
Scrapingly
Secularity
Seducingly
Selfacting
Selfaction
Selfmoving
Semaphoric
Semilunary
Sepulchring
Sermonical
Serpulidan
Shecklaton
Shockingly
Shoplifter
Shopwalker
Shortlived
Showerbath
Shrievalty
Sicklewort
Simulachre
Simulacher
Skylarking
Slidegroat
Slumbering
Smoldering
Smothering
Snakegourd
Somnipathy
Southernly
Spathiform
Speculator
Spermatoid
Sphenogram
Sphenoidal
Spheroidal
Spiculated
Splaymouth
Sporangium
Sportingly
Sportively
Sprightful
Springback
Springbuck
Springhalt
Springhead
Springlock
Spurgeflox
Stampeding
Staphyline
Starveling
Steamwinch
Stenograph
Stockinger
Stupefying
Subalmoner
Subcentral
Subcharter
Subcordate
Subdialect
Subjecting
Subkingdom
Sublimated
Submediant
Subreption
Subrogated
Subtrahend
Subtypical
Subverting
Supertonic
Surcingled
Suroxidate
Suzerainty
Swageblock
Swordfight
Symbolized
Sympathize
Symphonize
Syncarpion
Syncopated
Syncopized
Synthermal
Tambouring
Tambourine
Tamperings
Thanksgive
Thornbacks
Thrownsilk
Thumbrings
Thumbscrew
Thyroideal
Thyrsoidal
Tonguepads
Toparchies
Touchingly
Tourmaline
Townclerks
Tradesfolk
Tradewinds
Traducings
Traducible
Tragedians
Transfixed
Translucid
Transmoved
Trapeziums
Trapezoids
Travelings
Tremblings
Trenchplow
Trialogues
Triumphals
Troublings
Trucklings
Tumefyings
Turmalines
Twaincloud
Tympanized
Tympanizes
Ulcerating
Ulcerations
Underchaps
Underclays
Undercoats
Underlocks
Underplots
Underplays
Understock
Unimproved
Upbearings
Upblowings
Upbreaking
Upheavings
Uphoarding
Upholdings
Upholstery
Upswarming
Upthrowing
Uranalites
Vanquished
Vanquishes
Vaporingly
Vehiculary
Ventricans
Vermifuga'
Vesicatory
Vestibular
Vetchlings
Victualers
Vinesawfly
Violascent
Vocabulist
Volcanized
Volcanizes
Voltigeurs
Vouchsafed
Vulcanized
Vulcanizes
Vulcanites
Wainscoted
Wakerobins
Wardenship
Watchfires
Waveringly
Waxedcloth
Waxmyrtles
Weighboard
Weighlocks
Welcomings
Wheatbirds
Wheatplums
Whipgrafts
Whirlabout
Whirlbones
Whitelands
Wildgraves
Windbreaks
Windhovers
Windsucker
Winevaults
Wingcovert
Wingstroke
Wirecloths
Witherband
Witchmeals
Wolframine
Wolfspeach
Womanishly
Workingday
Worktables
Wormshaped
Worshipful
Wrainbolts
Wreathings
Wringstave
Wringbolts
Wrongheads
Wrongtimed
Xylographs
Yachtclubs
Zincamyles
Zincethyls
Zincmethyl

ADDITIONAL COMPETITIONS.

In the letters from our readers concerning this competition received during the weeks since its announcement, we have been favored with various suggestions of other competitions similar in character and object. We feel disposed to announce additional contests, but before doing so would like to hear further from our subscribers as to their ideas in the premises. Accordingly, we defer the matter for the time being, and trust all who have any ideas or suggestions on this subject will write us. What shall be the next contest? What subject will be of the greatest value to our readers? We want a large number of letters.

On Friday last the Scranton Steel Company, of Scranton, Pa., rolled 55 tons of 60-pound rails in one hour, the largest record thus far.

The Peoria Cordage Company, Peoria, Ill., have been organized with a capital stock of $200,000, and are now putting up a factory 84 feet front by 150 feet deep, three stories high. It is expected that they will commence manufacturing binder twine about the 1st of February, and will add rope machines at an early date. The company have additional ground upon which they can extend their business by enlargement of factory, and are also reported to have ample capital to carry on a successful business. Martin Kingman, of Kingman & Co., manufacturers of farm machinery, is president, and E. C. Heidrich, who has been connected with the Miamisburg Binder Twine Cordage Company for the past five years, and previous to that with John Bonte & Son, Cincinnati, Ohio, is vice-president, and will be the general superintendent of factory. Kingman & Co. are largely interested in this new concern, and it is expected that they will market extensively the product of the twine factory.

The Southern Railway and Steamship Association have issued a new rate sheet on pig iron, showing an advance of 20 cents a ton on the figures published in *The Iron Age* of September 27, page 458.

The Solitaire Coffee Urn.

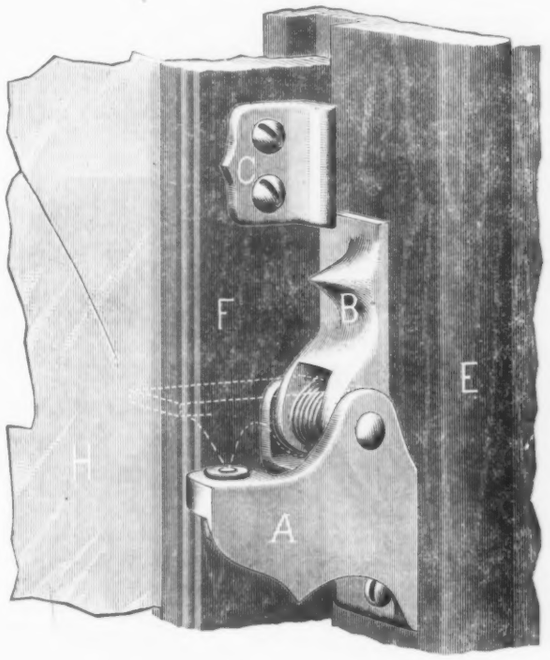
We illustrate below this article which is manufactured by the Charles F. Henis Company, Philadelphia, Pa., for whom S. A. Haines is agent, 90 Chambers street, New York. It is represented as placed in the cup in the manner in which it is used. This simple and attractive article consists of a cylinder or urn about 4 inches deep and 2¼ inches in diameter, with perforated bottom with a fine screen, and an encircling flange which rests on the top of the cup. The urn has, it will be observed, three projecting ribs which fit into openings in the encircling flange, permitting the urn to rest on the bottom of the cup. In this position the requisite quantity of boiling water is poured upon the coffee which is placed in the urn, which is permitted to remain in that position for a few minutes until the full strength of the coffee is extracted. The urn is then raised through the flange which remains stationary on the edge of the cup until the three

The Solitaire Coffee Urn.

projecting ribs are out of the notches, when slightly turning the urn it takes the position shown in the illustration. The urn is thus supported on a flange while the coffee percolates into the cup beneath. This article is neatly, and well made and finished in nickel plate. Attention is called by the manufacturers to the advantages of this simple contrivance as enabling one to have a cup of excellent coffee without the inconvenience that is attendant in making it in the usual way. The moderate price at which it is offered is a point deserving the attention of the trade, as is intended to be retailed at 25 cents.

The Rouser Burglar Alarm.

This article, which is illustrated in the cut given below, is manufactured by E. C. Ellwood, Green's Farms, Conn. It will be seen at a glance that this is a device for exploding a cartridge when the window or door to which it is applied is opened. The illustration represents it as attached to the right side of the window frame on the stop bead E, F being a portion of the sash. The hammer B is pivoted to the post A by a pin, as shown. The hammer when the alarm is set is held up by the stop C, which is screwed to the sash. When the hammer is raised to this position tension is put upon a coiled spring which encircles the pin above mentioned, and when the sash is raised a slight distance the stop C passes off the end of the hammer B, and the spring carries down the hammer, the point of which strikes the head of the cartridge, as indicated in the dotted lines. The cartridges used in this alarm are Smith & Wesson's 32 calibre central fire blanks. It is pointed out that

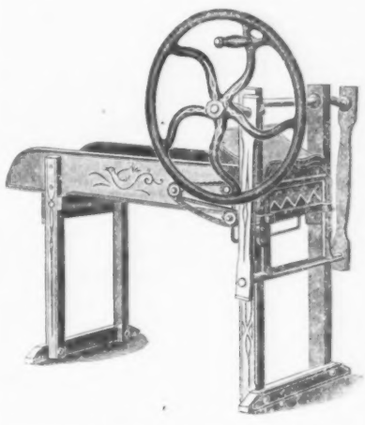


The Rouser Burglar Alarm.

the stop C may be so set that a very slight upward motion of the sash will free the hammer so that the alarm will operate before a burgler can pry up the lower sash enough to break a sash fastener. This device is also made in modified styles for application to doors, and it can also be readily attached to outside blinds. It is made in different styles of finish.

Richmond Champion Section Self-Feed Cutter.

The Wayne Works, Richmond, Ind., are making this machine, which is represented in the accompanying illustration, and its name indicates some of its special features. It is pointed out that the machine will cut

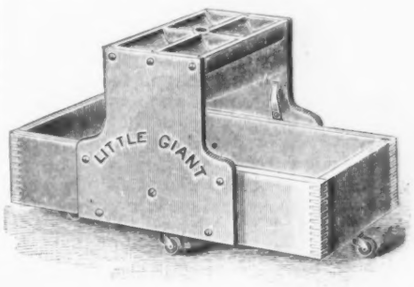


Richmond Champion Section Self-Feed Cutter.

any length the operator requires, and can be changed instantly by raising or lowering the stop on the left-hand side of the box, by merely slacking up the thumb-nut. This thumb-nut controls the greater or less throw of the feed rolls, and the greater the throw of the feed rolls the longer the cut; and the less the throw the shorter the cut. This box is referred to as cutting stalks with ease and rapidity, and is regarded as filling a long-felt want for a box that will handle corn stalks as well as straw with equal facility. The moderate price at which it is furnished is also alluded to, as well as its large capacity, it having 11-inch throw. In case of breakage any part can readily be renewed.

Farrier's Tool-Box.

Wells Bros. & Co., Greenfield, Mass., are putting on the market the Little Giant Farrier's Tool-Box, a cut of which is herewith given. It is, as its name implies, a



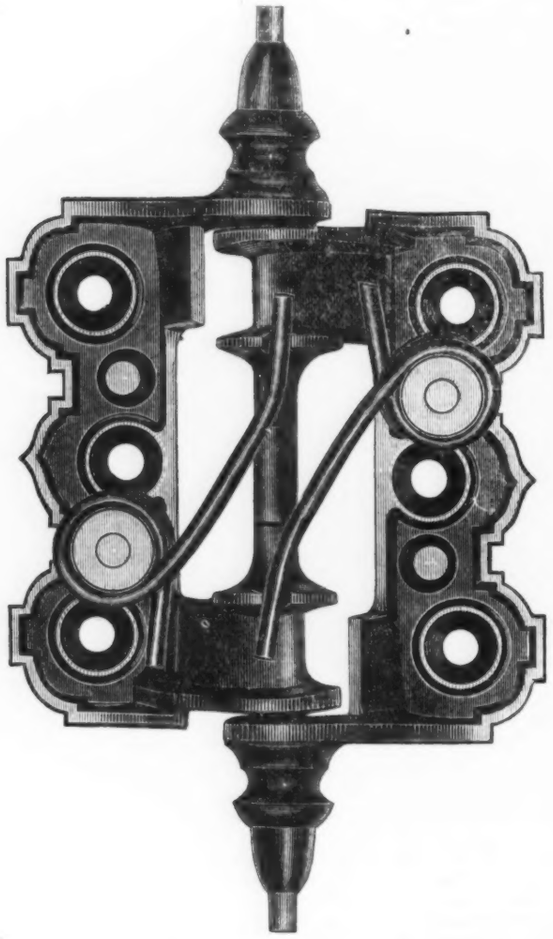
Farrier's Tool Box.

box for horseshoers' tools, and is described as made of thoroughly seasoned stock, lock corner, mortised bottom, and side pieces finely finished and thoroughly made. It is stated that this case, properly used, will last a horseshoer much longer than those commonly in use. The moderate price at which it is offered is also alluded to.

The new steel steamship Corona, built by Neafie & Levy for the Oregon Navigation Company, made a successful trial trip on the Delaware, on Saturday. A peculiarity about the Corona is that her masts, spars and decks, as well as her hull, are entirely of steel. She is 235 feet long, 36 feet beam and 23½ feet depth of hold, with triple-expansion engines of 1350 horsepower, with cylinders 21, 30 and 50 inches diameter and 3-foot stroke.

The J. G. C. Spring Hinge.

This hinge has recently been put on the market by the Coleman Hardware Company, 55 Dearborn street, Chicago, and



The J. G. C. Spring Hinge.

Morris, Ill. It is represented in the illustration herewith given, and has, it will be observed, two long springs arranged as shown in the cut, which are referred to as giving great elasticity and equalizing the tension. The simplicity of the hinge, the fact that it cannot come apart, that it is reversible and holds the door either open or closed, as desired, are points that are made in regard to it. It is put on the market with special claims for its merits as a light hinge, and the low price at which it is offered to the trade is also alluded to. Every pair is warranted satisfactory to the user, and samples will be sent to the dealer on application.

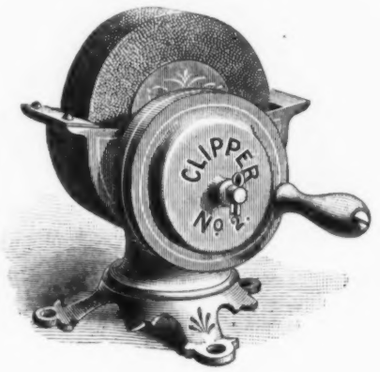
The Arcade Revolving Bench Plate.

An article which is said to be meeting with favor at the hands of metal workers, tinners, and others engaged in kindred trades, is a bench plate which has been placed on the market by F. E. Thompson, Elkhart, Ind. In the device which is here shown in general view the recently incorporated features are a square top instead of a round one and a more thoroughly braced underpiece. This bench plate is claimed by the makers to be adapted to receive any of the stakes, shears or other tools used in connection with bench work in the shops of tinners and sheet-metal workers. By its use tools can be turned in any position without being removed from it. Shears may be held at two angles, a feature which all the trade will appreciate. It is of comparatively small size, occupying a space 9 x 9 inches on the bench, and is so constructed that it may easily be placed in position. This device obviates the necessity of having a large iron plate provided with a number of holes, and also of cutting holes in the edge of the bench. It is carefully made and very durable in all its parts.

The McCormick offices in Chicago are being jacked up 6 feet 5 inches to meet the changes in street gradients. The building is 100 x 125 feet, six stories high and weighs nearly 20,000 tons. Several thousand screw-jacks are required, and 300 men to handle them. The lift is about 1 foot per day and it then takes a day to reset the jacks. The cost is estimated at about $40,000.

The Clipper Grinder No. 2.

The accompanying illustration represents this machine, which is made by the Higganum Mfg. Corporation, 189 and 191 Water street, New York. It is a small, neat and compact machine for sharpening small tools, knives, &c. It has a grinding wheel 6 inches in diameter, 1¼-inch face. It is called a free grit stone, and is made under an English patent. It is described as grinding a tool quickly without drawing the temper. It runs in a trough of water, and is geared to revolve four times to one turn of the crank.



The Clipper Grinder No. 2.

The swaying of the Washington monument when moved by the wind, as well as the expansion caused by the sun on its eastern side, is accurately indicated by a steel wire and plumb bob, suspended from a point 174 feet above the earth. When the structure is at rest the plumb line exactly corresponds with vertical marks.

Contracts were given to English shipbuilders last week for the building of ten tank oil-carrying steamships for use between Europe and Philadelphia and New York. The recent disasters to the tank steamships Ville de Calais and Hafis, it is said, will have no effect in preventing the building of tank vessels.

Improved Revolving Bench Plate.

CURRENT HARDWARE PRICES.

OCTOBER 24, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.

Caps, Percussion, ₩ 1000—
Hicks & Goldmark's
F. L. Waterproof, 1-10's.....50¢
E. B. Trimmed Edge, 1-10's.....65¢ } dis 25@ 25&
E. B. Ground Edge, Central Fire, 1-10's. 70¢
Double Waterproof, 1-10's.....$1.40 } 7½ %
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B.....30¢

Union Metallic Cartridge Co.
F. C. Trimmed.....50¢
F. L. Ground.....65¢ } dis 25@ 25&
Cen. Fire Ground.....70¢
Double Waterproof.....$1.40 } 7½ %
Double Waterproof, in 1-10's.....$1.40
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire.....$1.60

Cartridges—
Rim Fire Cartridges.....dis 50&5&2 %
Rim Fire Military.....dis 15&2 %
Central Fire, Pistol and Rifle.....dis 25&5&2 %
Central Fire, Military & Sporting...dis 15&5&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges .22 cal.....$1.75, dis 2 %
Blank Cartridges, 32 cal.....$3.50, dis 2 %
Primed Shells and Bullets.....dis 15&5&2 %
B. B. Caps, Round Ball.....$1.75, dis 2 %
B. B. Caps, Conical Ball, Swaged.....$2.00, dis 2 %

Primers—
Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells).....$1.00, dis 2 %
All other Primers, all sizes.....$1.20 dis 2 %

Shells—
First quality, 4, 8, 10 and 12 gauge..dis 25&10&2 %
First quality, 14, 16 and 20 gauge ($10 list).....dis 30&10&2 %
Star, Club, Rival and Climax Brands, 10 gauge, $9 list } dis 33½
12 gauge, $8 list } &10 2 %
Club, Rival and Climax Brands, 14, 16 and 20 gauge.....dis 30&10&2 %
Selbold's Combination Shot Shells.....dis 15&2 %
Brass Shot Shells, 1st quality.....dis 60&2 %
Brass Shot Shells, Club, Rival, Climax..dis 65&2 %
A. B. & C. Co., I. X. L., 10 & 12 gauge....d s 40&5&2 %
A. B & C. Co., "Special," 16 gauge..dis 30&10&5&2 %
A. B. & C. Co., "Special," 10 & 12 gauge...40&10&2 %
Fowler's Patent, 10 & 12 gauge. ₩ 100.....$3.25

Small extras given by some dealers.

Shells Loaded—
List No. 19, 1887.....dis 20 & 10 %

Wads—
U. M. C. & W. R. A.—B. E., 11 up...$2.00
U. M. C. & W. R. A.—B. E., 9&10 .. 2.30
U. M. C. & W. R. A.—E. E., 7&8.... 2.60
U. M. C. & W. R. A.—P. E., 11 up. 3.10
U. M. C. & W. R. A.—P. E., 9&10.. 4.00
U. M. C. & W. R. A.—P. E., 7&8 ... 490
Dis 20&2 % With small extras.
Eley's B. E., 11 up.....$1.75
Elev's P. E. 11 @ 20.....$2.80

Anvils.—Eagle Anvils.....₩ ℔ 10¢, dis 20 @ 20&5 %
Peter Wright's.....9½¢
Armitage Mouse Hole.....8¾¢
Armitage Mouse Hole, Extra.....11½@11½¢
Trenton.....9¼¢@9¾¢
Wilkinson's.....9¼¢@10¢
J. & Riley Carr. Patent Solid.....11@11½¢

Anvil Vise and Drill—
Millers Falls Co.....$18.00, dis 20 %
Cheney Anvil and Vise.....dis 25 %
Allen Combined Anvil and Vise.....$3, dis 40&10 %
Moore & Barnes Mfg. Co.....dis 33⅓ %

Apple Parers.

Advance.....₩ doz. $4.75
Antrim Combination.....₩ doz. 5.50
Baldwin.....₩ doz. 5.25
Champion.....₩ doz. 7.25
Eureka, 1888.....each 17.00
Family Bay State.....₩ doz. 12.00
Gem.....₩ doz. 5.25
Gold Medal.....₩ doz. 4.00
Hudson's New '88.....₩ doz. 3.75
Ideal.....₩ doz. 4.75
Improved Bay State.....₩ doz. 30.00
Little Star.....₩ doz. 6.00
Monarch.....₩ doz. 13.50
New Lightning.....₩ doz. 5.50
Oriole.....₩ doz. 4.00
Penn.....₩ doz. 4.00
Perfection.....₩ doz. 4.00
Pomona.....₩ doz. 4.00
Rocking Table.....₩ doz. 6.00
Turntable.....₩ doz. 4.50
Victor.....₩ doz. 13.50
Waverly.....₩ doz. 4.50
White Mountain.....₩ doz. 4.50
72.....₩ doz. 4.25
76.....₩ doz. 5.75
78.....₩ doz. 6.50

Augers and Bits.

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher)
.....dis 70 %
New Haven Copper Co.....dis 60&10&10 %
Cook's, Douglass Mfg. Co.....dis 50 %
Cook's, New Haven Copper Co...dis 50&10&50&10&5 %
Ives' Circular Lip.....dis 60 %
Patent Solid Head.....dis 30 %
C. E. Jennings & Co., No. 10, extension l'p.....dis 40 %
C. E. Jennings & Co., No. 50.....dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ₩ set, 32½ quarters, No 5, $5; No. 3C, $2.....dis 20 %
Lewis' Patent Single Twist.....dis 45 %
Russell Jennings' Augers and Bits.....dis 25 %
Imitation Jennings' Bits(new list).....dis 60@65&5 %
Pugh's Black.....dis 20 %
Car Bits.....dis 50&10&60 %
L'Hommedieu Car Bits.....dis 15&10 %
Forstner Pat. Auger Bits.....dis 10 %

Follow Augers—
Ives
French, Swift & Co.
Douglass'
.....dis 25&10 @ 25&10&5 %
Bonner's Adjustable ₩ doz. $48.....dis 40&10 %
Stearns'.....dis 20&10 %
Ives' Expansive, each $4.50.....dis 50&10 %
Universal Expansive, each $4.50.....dis 20 %
Wood's.....dis 25 @ 25&10 %

Expansive Bits—
Clark's small, $18; large, $26.....dis 35 @ 35&5 %
Ives' No. 4, per doz., $60.....dis 35 @ 40 %
Swan's.....dis 40 %
Steer's, No. 1, $26; No. 2, $22.....dis 35 %
Stearns' No. 2, $48.....dis 20 %

Gimlet Bits—
Common.....₩ gross $2.75 @ $3.25
Diamond.....₩ doz. $1.10, dis 25&10 %
"Bee".....dis 25 @ 25&5 %
Double Cut, Shepardson's.....dis 45 @ 45&5 %
Double Cut, Ct. Valley Mfg. Co.....dis 30&10 %
Double Cut, Hartwell's, ₩ gro.....$5.25
Double Cut, Douglass'.....dis 40&10 %
Double Cut, Ives'.....dis 60 @ 60&5 %

Bit Stock Drills—
Morse Twist Drills.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Cleveland.....dis 50&10&5 %
Syracuse, for metal.....dis 50&10&5 %
Syracuse, for wood (wood list).....dis 30 @ 30&5 %
Williams' or Holt's, for metal.....dis 50&10&10 %
Williams' or Holt's, for wood.....dis 40&10 %

Ship Augers and Bits—
L'Hommedieu's.....dis 15&10 %
Watrous's.....dis 15&10 %
Snell's.....dis 15&10 %
Snell's Ship Auger Patt'n Car Bits, dis 15&10 %
Extras often given.

Awl Hafts.

Sewing, Brass Ferrule.....$3.50 ₩ gross—dis 45&10 %
Patent Sewing, Short.....$1.00 ₩ doz—dis 40&10 %
Patent Sewing, Long.....$1.20 ₩ doz.—net
Patent Peg, Plain Top.....$10.00 ₩ gross—dis 45&10 %
Patent Peg, Leather Top.....$12.00 ₩ gross—dis 45&10 %

Awls, Brad Sets, &c.

Awls, Sewing, Common.....₩ gross $1.70—dis 35 %
Awls, Shouldered Peg....₩ gross $2.45—dis 40@40&10 %
Awls, Patent Peg.....₩ gross 63¢—dis 40@40&10 %
Awls, Shouldered Brad.....$2.70 ₩ gross—dis 35 %
Awls, Handled Brad.....$7.50 ₩ gross—dis 45 %
Awls, Handled Scratch.....$7.50 ₩ gross—dis 35&10 %
Awls, Socket Scratch.....$1.50 ₩ doz—dis 25 @ 30 %

Awl and Tool Sets.

Aiken's Sets. Awls & Tools, No. 20, ₩ doz. $10—dis 55&10 %
Fray's Ad Tool Hdls., Nos. 1, $12; 2, $18.; 3. $12; 4, $9. dis 25@25&10 %
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18. dis 25 %
Henry's Combination Haft.....₩ doz. $6
Brad Sets, No. 42, $10.50. No. 43, $12.50. dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50.
Brad Sets, Stanley's Excelsior, No. 2, $4.00. } dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 3, $5.50.

Axes.

Makers' and Special Brands—
First quality.....₩ doz. $6.00 @ $6.50
Others.....₩ doz. $5.50 @ $5.75

Axle Grease.

Fraser's, in bulk.....Keg ₩ ℔, 4¢; Pail, ₩ ℔, 5¢ net
Frasers, in boxes.....₩ gross $9.50
Dixon's Everlasting, in bxs., ₩ doz., 1 ℔: $1.20; 2 ℔, $2
Dixon's Everlasting.....10-℔ pails, each, 85¢
Lower grades, special brands.....₩ gro $5.50 @ $7

Axles.—No. 1, 4¢ @ 4¼¢; No. 2, 5¼ @ 5½¢.

Nos. 7 to 18.....dis 50&55 %
Nos. 19 to 22.....dis 60&10&10@70 %
National Wrought Steel Tubular Self-Oiling:
Standard Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets.....dis 33⅓ %
Over 10 sets.....dis 33⅓&5 %
X Strong Exp. (6 to 9), & XX Strong Truck (10 to 16):
Less than 10 sets.....dis 10 %
Over 10 sets.....dis 10&5 %

Bag Holders.

Sprengle's Pat., ₩ doz $18.....dis 60 %

Balances.—Spring Balances.

Common 24 ℔.....₩ doz., $1.50—dis 50 %
Chatillon's Spring Balances.....dis 50 %
Chatillon's Circular Spring Balances.....dis 60 %

Bells.

Hand—
Light Brass.....dis 70&10 %
Extra Heavy.....dis 60&10 %
White Metal.....dis 60&10&10 %
Silver Chime.....dis 33⅓&10 %
Globe (Cone's Patent).....dis 25&10 @ 35 %

Door—
Gong, Abbe's.....dis 33⅓&10 %
Gong, Yankee.....dis 45&10 %
Gong, Barton's.....dis 40&10 @ 50 %
Crank, Taylor's.....dis 25&10 %
Crank, Brooks'.....dis 50&10&2 %
Crank, Cone's.....dis 10 %
Crank Connel's.....dis 20&10 %
Lever, Sargent's.....dis 60&10 %
Lever, Taylor's Bronzed or Plated.....net
Lever, Taylor's Japanned.....dis 25&10 %
Lever, R. E. ₩ Co.'s.....dis 50&10&2 %
Pull, Brook's.....dis 50&10&2 %
Pull Western.....dis 25&10 %

Cow—
Common Wrought.....dis 60&10 %
Western.....dis 20&10 %
Western, Sargent's list.....dis 70&10 %
Kentucky "Star".....dis 20&10 %
Kentucky, Sargent's list.....dis 70&10 %
Dodge, Genuine Kentucky, new list..dis 70@70&10 %
Texas Star.....dis 50&10 @ 50&10&5 %
Pull.....dis 40@40&5 %
Farm Bells.....₩ ℔, 3¢ @ 3½¢
Steel Alloy Church and School Bells.....dis 40 %

Bellows.—Blacksmiths'.....dis 50@10&5 @ 60 %
Molders'.....dis 40 @ 40&10 %
Hand Bellows.....dis 40@10 @ 50 %

Belting, Rubber.

Common Standard.....dis 70&10 %
Standard.....dis 70&70&5 %
Extra.....dis 60&10 %
N. Y. R. & P. Co., Standard.....dis 60&5 %
N. Y. R. & P Co., Extra Standard.....dis 50&10 %

Bench Stops.

Morrill's.....₩ doz $9—dis 50 %
Hotchkiss's.....₩ doz $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10; No. 2, $9...dis 25&10&5 %
McGill's.....₩ doz $3—dis 10 %

Bits.—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders.

Extension, Barber's.....₩ doz $15.00—dis 40 @ 40&10 %
Extension, Ives'.....₩ doz $20.00—dis 60&5 @ 60&10 %
Diagonal.....₩ doz $24.00—dis 40 %
Angular.....₩ doz $24.00—dis 40&5 %

Blind Adjusters.

Domestic.....₩ per doz $3.00—dis 33⅓ %
Excelsior.....₩ doz $10.00—dis 50&10&2 %
Washburn's Self-Locking.....dis 20 @ 20&10 %

Blind Fasteners.

Mackrell's.....₩ doz pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern.....$15 ₩ gro.—dis 60&10 %
Van Sand's Old Pattern.....$15 ₩ gro.—dis 55&10 %
Washburn's Old Pattern.....$9 ₩ gro. net
Merriman's.....new list, net
Austin & Eddy No. 2008.....$9 ₩ gro. net
Security Gravity.....$9 ₩ gro. net

Blind Staples.

Barbed, ¾ in. and larger.....₩ ℔ 7½ @ 8¢ net
Barbed, ⅝ in.....₩ ℔ 8½ @ 9¢ net

Blocks.

Ordinary Tackle, list April 17, '85.....dis 40 %
Cleveland Block Co., Mal. Iron.....dis 50 %
Novelty Tackle Blocks, Mal. Iron.....dis 50 %

Bolts.

Door and Shutter—
Cast Iron Barrel, Square, &c.....dis 70 @ 70&10 %
Cast Iron Shutter Bolts.....dis 70 @ 70&10 %
Cast Iron Chain (Sargent's list).....dis 65&10 %
Ives' Patent Door Bolts.....dis 60 %
Wrought Barrel.....dis 70 @ 70&10 %
Wrought Square.....dis 70 @ 70&10 %
Wr't Shutter, all iron, Stanley's list.....dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's.....dis 40&10 %
Wrought Shutter, Sargent's list.....dis 60&10 %
Wrought Sunk Flush, Sargent's list.....dis 55&10 %
Wrought Sunk Flush, Stanley's list.....dis 50&10 %
Wrought S. K. Flush, Com'n Stanley's list..dis 55&10 %

Carriage—
Com. list June 10, '84.....dis 75&2½&2 %
Genuine Eagle, list Oct., '84.....dis 75&10 %
Phila. pattern, list Oct. 7, 84...dis 75&10@75&10&5 %
S. B. & W. old list.....dis 70 %

Tire—
Common, list Feb. 28, 1883.....dis 70 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883.....dis 70 %
P. C. B. & N. Co., Philadel., list Oct. 84.....dis 82½ %
P.C.B.&N.Co., Keystone, Phil. list. Oct.'84.....dis 80 %
P.C.B.&N.Co., Norway, Phil. list. Oct.'84.dis 75&10 %
Am. S. Co., Norway, Phil., list Oct. 16.'84..dis 75&10 %
Am. S. Co., Eagle, Phil., list Oct. 16.'84.....dis 80 %
Am. S. Co., Philadel. list, Oct. 16, 84.....dis 82½ %
Am. S. Co., Bay State, list Feb. 28.'83.....dis 70 %
R. B. & W., Philadel. list Oct. 16, 1884.....dis 82 %
R. & E. Mfg. Co.....dis 70 %

Stove and Plow—
Stove.....dis 62½ %
Plow.....dis 60&5 %
Am. S. Co. Stove, Annealed.....dis 62½ %
R. B. & W., Plow.....dis 55 %
R. B. & W., Stove.....dis 62½ %
R. & E. Mfg Co., Stove.....dis 62½ %
Machine, according to size.....dis 75&10 @ 80 %
Bolt Ends, according to size.....dis 75&10 @ 80 %

Borax.

₩ ℔ 9¾@10¾¢

Boring Machines.

Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75.....dis 50 %
Snell's, Rice's Patent	5.50	6.75.dis 40&10&10 %
Jennings	5.50	6.75.dis45@45&10%
Other Machines	3.35	2.75.....net
Phillips' Pat., with Augers	7.00	7.50.....net

Bow Pins

Humason, Beckley & Co.'s.....dis 60&10 %
Sargent & Co.'s.....$17 and $18, dis 60&10 %
Peck, Stow & W. Co.....dis 50&10 @ 50&10&5 %

Braces.

Backus, Nos. 110 to 114 and 31 to 33..dis 60&5@60&10%
Backus, Nos. 6, 8, 12, 14.....dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7 9, 11.....dis 70&10&5 %
Barber's, Nos. 10 to 16.....dis 50 %
Barber's, Nos. 30 to 33.....dis 50¢
Barber's, Nos. 40 to 63.....dis 50&10&10¢
Barker's, Nos. 8, 10 and 12.....dis 75&10@80 %
Barker's, Plated, Nos. 8, 10 and 12.....dis 65&10@70 %
Osgood's Ratchet.....dis 40&10@50 %
Spofford's.....dis 50&10 %
Ives' New Haven Novelty.....dis 70 @ 70&5 %
Ives' New Haven Ratchet.....dis 60&5 @ 60&10 %
Ives' Barber Ratchet.....dis 60&5 @ 60&10 %
Ives' Barbers.....dis 60&5 @ 60&10 %
Ives' Spofford.....dis 60&5 @ 60&10 %
Common Ball, American.....$1.10 @ $1.15
Bartholomew's, Nos. 25, 27, 30.....dis 50&10@60&5 %
Bartholomew's, Nos. 117 118 119.....dis 70 @ 70&5 %
Amidon's Barker's Imp'd Pla'n.....dis 75&10 @ 80 %
Amidon's Barker's Imp. Nickeled.....dis 65&10 @ 70 %
Amidon's Ratchet.....dis 75&10 @ 80 %
Amidon's Eclipse Ratchet.....dis 60 %
Amidon's Globe Jawed.....dis 40&10&10 %
Amidon's Corner Brace.....dis 40 @ 40&10 %
Amidon's Universal.....8 in., $2.10; 10 in., $2.25
Amidon's Buffalo Ball.....$1.10 @ $1.15
P. S. & W.....dis 50&10 %

Brackets.

Shelf, plain, Sargent's list.....dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list.....dis 60&10 @ 60&10&10 %
Reading, plain.....dis 60&10 @ 60&10&5 %
Reading, Rosette.....dis 60&10 @ 60&10&10 %

Bright Wire Goods.....dis 87½ @ 87½&10 %

Broilers.

Inch.	₩	10	₩ x 11
Per doz.		$4.50	5.50 6.50

Heins' Self-Basting.

Buckets.—See Well Buckets and Pails.

Bull Rings.—Union Co. Nut.....dis 55 %

Sargent's.....dis 66⅔&10 @ 70&5 %
Hotchkiss' low list.....dis 30 %
Humason, Beckley & Co.'s.....dis 70 %
Peck, Stow & W. Co.'s.....dis 50&10 @ 50&10&10 %
Ellrich Hdw. Co., White Metal, low list..dis 50@50&10 %

Butcher's Cleavers.

Bradley's.....dis 25 @ 30
L. & I. J. White.....dis 20&5 %
Beatty's.....dis 40 @ 40&5%

1	2	3	4	5	6	7	8
$15.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s.....dis 40 %
P. S. & W.....dis 33⅓&5@33⅓&10 %

Butts.

Brass—
Wrought Brass.....dis 70@70&10 %
Cast Brass, Tiebout's.....dis 33⅓ %
Cast Brass, Corbin's Fast.....dis 33⅓&10 %
Cast Brass, Loose Joint.....dis 33⅓&10 %

Cast Iron—
Fast Joint, Narrow.....dis 50&10 %
Fast Joint, Broad.....dis 55&10 %
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns.
Parliament Butts.
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned.
Loose Pin, Acorns, Jap, Pltd. Tips.
.....dis 70&10

Wrought Steel—
Fast Joint Narrow....dis 70&10 %
Fast Joint, Lt. Narrow....dis 70&10 %
Fast Joint, Broad....dis 70&10 %
Loose Joint, Broad....dis 70&10 %
Table Butts, Back Flaps, &c....dis 70&10 %
Inside Blind, Regular....dis 70&10 %
Inside Blind, Light....dis 70&10 %
Loose Pin....dis 70&10 %
Bronzed Wrought Butts....dis 40&10@40&10&5 %

Calipers.—See Compasses.

Calks, Toe.
Gautier....₩ ℔ 5½@6¢
Dewicks....₩ ℔ 5½@6¢

Can Openers.
Messenger's Comet....₩ doz $3.00, dis 25 %
American....₩ gross $3.00
Duplex....₩ doz 25¢, dis 15 @ 20 %
Lyman's....₩ doz $3.75, dis 20 %
No. 4, French....₩ doz $2.25, dis 55 @ 60 %
No. Iron handle....₩ gross $6.00, dis 45 @ 50 %
Eureka....₩ doz $2.50, dis 10 %
Sardine Scissors....₩ doz $2.70@$3 00 %
Star....₩ doz $2.75 %
Sprague, No. 1, $2; 2, $2.25; 3, $2.50....dis 50&10&10 %
World's Best, ₩ gross, No. 1, $12.00; No. 2, $24.00, No. 3, $36.00....dis 50&10 %
Universal....₩ doz $3.00, dis 35&5 %
Domestic....₩ doz $2.50, dis 45 %
Champion....₩ doz $2.00, dis 50 %

Cards.
Horse and Curry....dis 10&10 @ 10&10&10 %
Cotton....New list, Aug., 1883, dis 10 @ 10&10 %
Wool.... " " " dis 10 @ 10&10 %

Carpet Stretchers.
Cast Steel, Polished....₩ doz $2.25
Cast Iron, Steel Points....₩ doz 80¢
Socket....₩ doz $1.75
Bullard's....dis 20 @ 25&10 %

Carpet Sweepers.
Bissell No. 5....₩ doz $17.00
Bissell No. 7 New Drop Pan....₩ doz $19.00
Bissell Grand....₩ doz $36 00
Grand Rapids....₩ doz $24.00
Crown Jewel....No. 1, $18; No. 2, $19; No. 3, $20
Magic....₩ doz $15.00
Jewel....₩ doz $17.00
Improved Parlor Queen, Nickeled Trimmings....₩ doz $27.00
Improved Parlor Queen, Japanned Trimmings....₩ doz $24.00
Excelsior....₩ doz $22.00
Garland....₩ doz $18.00
Parlor Queen....₩ doz $24.00
Housewife's Delight....₩ doz $15.00
Queen....₩ doz $16.00
Queen, with band....₩ doz $18.00
King....₩ doz $30.00
Weed Improved....₩ doz $18.00
Hub....₩ doz $16.00
Cog Wheel....₩ doz $16.00

Cartridges.—See Ammunition.

Casters.
Bed....New list:
Plate....Brass...dis 55 @ 55&5 %
Shallow Socket....Others...dis 60 @ 60&5 %
Deep Socket....40&10 %
Yale Casters, list May, 1884....dis 30&10@40 %
Yale, Gem....dis 60@60&5 %
Martin's Patent (Phœnix)....dis 45&10 @ 50 %
Payson's Anti-friction....dis 60 @ 60&10 %
"Giant" Truck Casters....dis 10 @ 10&5 %
Stationary Truck Casters....dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s....dis 70 %
Sargent's....dis 66⅔&10 %
Hotchkiss....dis 30 %
Peck Stow & W. Co....dis 50&10 %

Chain.
Trace, 6¼-10-2, exact sizes, ₩ pair, $1 03 } dis 50&10@
Trace, 6¼-10-3, exact sizes, ₩ pair, .92 } 50&10&5 %
Trace .7-10-2, exact sizes...₩ pair, 1.11

NOTE.—Traces, "Regular" sizes 3¢ net ₩ pair less than exact.

Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884....dis 50&10 @ 50&10&5 %
American Coil 5-16 ¼ 3-16 ⅜ 7-16 ½
In cask lots, 8.75 6.25 5.00 4.50 4.40 4.00 3.75 3.50
Less than cask lots, add ½¢@1½¢ ₩ ℔.
German Coil, list of June 20, 1887....dis 50&10&5@60 %
Ger. Halter Chain, list of June 20, 1887....dis 50&10&5@60 %
Covert Halter, Hitching and Breast....dis 50&2 %
Covert Traces....dis 35@2 %
Oneida Halter Chain....dis 60 @ 60&5 %
Galvanized Pump Chain....₩ ℔ 5½¢ @ 6¢
Jack Chain, Iron....dis 70&10 @ 75 %
Jack Chain, Brass....dis 65 @ 70 %

Chalk.—White.
....₩ gro 50¢
Red....₩ gro 70¢
Blue....₩ gro 85¢
White Crayons....₩ gro 12¢ @ 12½ dis 10¢

Chalk Lines.—See Lines.

Chisels.
Socket Framing and Firmer—
P., S. & W.... } dis 75&5 @
New Haven and Middlesex.... } 75&10 %
Mix....
Ohio Tool Co....
Buck Bros....dis 30 %
Merrill....dis 60&10@60&10&5 %
L. & I. J. White....dis 30 @ 30&5 %
Witherby and Douglass....dis 75 @ 75&5 %
Tanged Firmers....dis 40&10 %
Tanged Firmers, Butcher's....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's....$5.00 to £
Tanged Firmers, Buck Bros....dis 30 %
Cold Chisels, ₩ ℔....16¢ @ 19¢

Chucks.
Beach Patent....each, $8.00, dis 20 %
Morse's Adjustable....each, $7.00, dis 20 @ 20&5 %
Danbury....each, $6.00, dis 30 @ 30&5 %
Syracuse, Bals Pat....dis 25 %

Clamps.
Providence Tool Co.'s Wrought Iron....dis 25 %
Adjustable, Gray's....dis 20 %
Adjustable, Lambert's....dis 20 %
Adjustable, Snow's....dis 40&5 %
Adjustable, Hammer's....dis 15 %
Adjustable, Stearns'....dis 20&10 %
Stearns' Adjustable Cabinet and Corner....dis 20&10 %
Cabinet, Sargent's....dis 66⅔&10 %
Carriage-Makers', Sargent's....dis 70&10 %
Eberhard Mfg. Co....dis 40&5 @ 40&10 %
Warner's....dis 40&10 @ 40&10&5 %
Saw Clamps....See Vises

Clips.
Norway, Axle, ¼ & 5-16....dis 55&5&5
Second grade Norway Axle, ¼ & 5-16....dis 65&5
Superior Axle Clips....dis 66⅔&5 @ 66⅔&5&5 %
Norway Spring Bar Clips, 5-16....dis 60&5&5
Wrought-Iron Felloe Clips....₩ ℔ 5½¢
Steel Felloe Clips....₩ ℔ 5¢
Baker Axle Clips....dis 25 %

Cockeyes.
....dis 50 %

Cocks, Brass.—Hardware list....dis 40&10&2 %

Coffee Mills.
Box and Side, List revised Jan. , 1888....dis 50&2 %
American, Enterprise Mfg. Co....dis 20&10@30 %
The "Swift," Lane Bros....dis 20&10 %

Compasses, Dividers, &c.
Compasses, Calipers, Dividers....dis 70@70&10 %
Bemis & Call Co.'s Dividers....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside....dis 50&5 %
Bemis & Call Co.'s Double....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside)....dis 30 %
Excelsior....dis 50 %
Stevens & Co.'s Calipers and Dividers....dis 25&10 %
Starrett's Spring Calipers and Dividers....dis 25&10&10 %
Starrett's Lock Calipers and Dividers....dis 25&10 %
Starrett's Combination Dividers....dis 25&10 %

Coopers' Tools.
Bradley's....dis 20 %
Barton's....dis 20@20&5 %
L. & I. J. White....dis 20&5 %
Albertson Mfg. Co....dis 25 %
Beatty's....dis 40 @ 40&5 %
Sandusky Tool Co....dis 30 @ 30&5 %

Corkscrews.
Humason & Beckley Mfg. Co....dis 40 @ 40&10 %
Clough's Patent....dis 33⅓ @ 33⅓&5 %
Howe Bros. & Hulbert....dis 35 %

Corn Knives and Cutters.
Bradley's....dis 10 %
Wadsworth's....dis 25 %

Cradles.—Grain....dis 50&2 %

Crow Bars.—Cast Steel....₩ ℔ 4¢
Iron, Steel Points....₩ ℔ 3½¢

Curry Combs.
Fitch's....dis 50&10 @ 50&10&10 %
Rubber....₩ doz $10.00, dis 20 %
Perfect....dis %

Curtain Pins.—Silvered Glass....net
White Enamel....net

Cutlery.
Beaver Falls and Booth's....dis 33⅓ %
Westenholme....$7.75 to £

Dampers, &c.
Dampers, Buffalo....dis 50 %
Buffalo Damper Clips....dis 50 %
Crown Damper....dis 40 %
Excelsior....dis 40&10 %

Dividers—See Compasses.

Dog Collars.
Embossed Gilt, Pope & Stevens' list....dis 30&10 %
Leather, Pope & Stevens' list....dis 40 %
Brass, Pope & Stevens' list....dis 40 %

Door Springs.
Torrey's Rod, regular size....₩ doz $1.30
Gray's....₩ gro, $20.00, dis 20 %
Bee Rod....₩ gro, $20.00, dis 20 %
Warner's No. 1, ₩ doz, $2.50; No. 2, $3.30, dis 40&10@50 %
Gem (Coil), list April 19, 1886....dis 10 %
Star (Coil), list April 19, 1886....dis 20 %
Victor (Coil)....dis 60 @ 60&10 %
Champion (Coil)....dis 60&10 @ 60&10&10 %
Philadelphia....5 in., $5.00; 8 in., $7.75, dis 30 %
Cowell's....No. 1, ₩ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete....₩ doz $4.50, dis 55&10 %
Hercules....dis 50 %
Shaw Door Check and Spring....dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring....dis 25 %

Drawing Knives.
P., S. & W.... } dis 75&5 @
Mix.... } 75&10 %
New Haven and Middlesex....
Merrill....dis 60&10&10 %
Witherby and Douglass....dis 75@75&5 %

Dr'lls and Drill Stocks.
Watrous....dis 15&10 @ 25 %
L. & I. J. White....dis 20&5 %
Bradley's....dis 35 %
Adjustable Handle....dis 25 @ 33⅓ %
Wilkinson's Folding....dis 25 @ 25&5 %

Dr'lls and Drill Stocks.
Blacksmiths'....each, $1.75
Blacksmiths' Self-Feeding....each, $7.50, dis 20 %
Breast, P. S. & W....dis 40&10 %
Breast, Wilson's....dis 30&5 %
Breast, Millers Falls....each, $3.00 dis 25 %
Breast, Bartholomew's... each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's....dis 20 @ 20 & 5 %
Ratchet, Ingersoll's....dis 25 %
Ratchet, Parker's....dis 20 @ 20&5 %
Ratchet, Whitney's....dis 20&10 %
Ratchet, Weston's....dis 20@25 %
Ratchet, Moore's Triple Action....dis 25 @ 30 %
Whitney's Hand Drill, Plain, $11.00, Adjustable, $12.00....dis 20&10 %
Wilson's Drill Stocks....dis ₩ %
Automatic Boring Tools....each, $1.75 @ $1.85

Twist Drills—
Morse....dis 50&10&5 %
Standard....dis 50&10&5 %
Syracuse....dis 50&10&5 %
Cleveland....dis 50&10&5 %
Williams....dis 50&10&10 %

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans.—Small sizes....₩ ℔ 6¼¢
Large sizes....₩ ℔ 6¼¢

Egg Beaters.
Dover....₩ doz., $2.00
National....₩ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.)....₩ gro, $17.00@$18.00
Kingston (Standard Co.)....₩ gro, $6.50
Acme (Standard Co....₩ gro, $6.00
Duplex (Standard Co.)....₩ gro, $15.00
Duplex, extra heavy....₩ doz extra $5.00
Rival (Standard Co.)....₩ gro, $12.00
Triumph (T. & S. Mfg. Co.)....₩ gro, $10.50@$11.50
Advance No. 1....₩ gro $10.50
Advance, No. 2....₩ gro $10.00
Bryant's....₩ gro $15.00
Ayres' Spiral....₩ gro $5
Double (Hamblin & Russell Mfg. Co.)....₩ gro, $16.20
Easy (Hamblin & Russell Mfg. Co.)....₩ gro, $14.00
Triple (Hamblin & Russell Mfg. Co.)....₩ gro, $16.20
Spiral (Hamblin & Russell Mfg. Co.)....₩ gro, $4.50
Paine, Diehl & Co's....₩ gro $24.00

Egg Poachers.
Buffalo Steam Egg Poachers, ₩ doz., No. 1, $6 00; No. 2, $9.00....dis 25 %

Electric Bell Sets.—Wollensak's....dis 15 %
Bigelow & Dowse....dis 20 %

Emery.

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF FF.
Kegs, ₩ ℔	4 ¢	5 ¢	2½¢
½ kegs, ₩ ℔	4½¢	5½¢	2¾¢
¼ kegs, ₩ ℔	4¾¢	5¾¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6¾¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron, list Nov. 11, 1885....dis 50&10 @ 50&10&5
Brass....dis 60 @ 60&5 %

Escutcheons.
Door Lock....Same discounts as Door Locks
Brass Thread....dis 60 @ 60&10 %
Wood....dis 25 %

Faucets.
Fenn's....dis 40 %
Bohren's Patent Rubber Ball....dis 25 %
Fenn's Cork Stops....dis 33⅓ %
Star....dis 60 %
Frary's Patent Petroleum....dis 40&5&2 %
West's Patent Key....dis 50&10 %
Anchor Lock....dis 45 %
Metallic Key, Leather Lined...dis 60&10 @ 60&10&10 %
Cork Lined....dis 70&5 @ 70&10 %
Burnside's Red Cedar....dis 50 %
Burnside's Red Cedar, bbl. lots....dis 50&10 %
J. Sommer's Peerless Best Block Tin Key....dis 40 %
J. Sommer's IXL, 1st quality, Cork Lined....dis 50 %
J. Sommer's Diamond Lock....dis 40 %
J. Sommer's Perfection, Fla. Reed Cedar....dis 50 %
J. Sommer's Goodenough Cedar....dis 60 %
Self-Measuring, Enterprise...₩ doz $36.00—dis 20&10 %
Self-Measuring, Lane's....₩ doz $36.00—dis 25&10 %
Self-Measuring, Victor....₩ doz $36.00—dis 25&10 %

Felloe Plates....₩ ℔ 6 @ 6½¢

Fifth Wheels.—Derby and Cincinnati....dis 45&5 %

Files.
Domestic—
Nicholson Files, Rasps, &c....dis 60&5 @ 60&10 %
Nicholson (X. F.) Files....dis 25 %
Nicholson's Royal Files (Seconds)....dis 75 (extra prices on certain sizes.)
Other makers, best brands....dis 60&5 @ 60&10&5 %
Fair brands....dis 60&10&10 @ 70 %
Second quality....dis 70&5 @ 75 %
Heller's Horse Rasps....dis 50&7½ @ 50&10 %
McCaffrey's Horse Rasps....dis 50&10 %
Imported—
J. & Riley Carr....List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps....dis 10 %
Mouat & Gamble....List April 1, 1883, dis 15 %
Butcher....Butcher's list, dis 20 %
Stubs....Stubs list, dis 25 @ 30 %
Turton's....Turton's list dis. 20 @ 25 %
Beeaves' Horse Rasps....American list d 60 %

Flu ing Machines.
Knox, 4¼-inch Rolls....$3.25 each
Knox, 6-inch Rolls....$3.60 each } dis 35 %
Eagle 3¼-inch Roll....$2.15, dis 35 %
Eagle, 5¼-inch Roll....2.85, dis 35 %
Crown, 4¼ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel....6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter....$1.50 each, net
Geneva Hand Fluter, White Metal....₩ doz $12, dis 35 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10, dis 30 %
Shepard Hand Fluter, No. 85....₩ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110....₩ doz $11, dis 40 %
Shepard Hand Fluter, No. 95....₩ doz $8, dis 40 %
Clark's Hand Fluter....₩ doz $15.00, dis 35 %
Combined Fluter and Sad Iron....₩ doz $15.00, dis 30 %
Buffalo....₩ doz $10.00 dis 10 %

Fluting Scissors....dis 45 %

Fodder Squeezers.
Blair's....₩ doz $2.00
Blair's, "Climax"....₩ doz $1.25

Forks.—Hay, Manure, &c., Asso. list....dis 65&5 %
Hay, Manure, &c., Phila. list....dis 60 @ 60&5 %
Plated, see Spoons.

Freezers, Ice Cream.
Buffalo Champion....dis 60&10&5 %
Shepard's Lightning....dis 66 %
White Mountain....dis 60 %

Fruit and Jelly Presses.
Enterprise Mfg. Co....dis 20&10 @ 30 %
Henis....₩ doz $4.50
P. D. & Co....₩ doz $4.50
Shepard's Queen City....dis 40 %

Fry Pans.
High List....dis 75&5 @ 75&10 %

No....	0	1	2	3	4	5	6	7	8	9	10
₩ doz...	$3.75	4.70	5.30	5.95	6.55	7.50	8.75	10.00	11.25		
Low List....dis 65&10 %											
No....	0	1	2	3	4	5	6	7	8		
₩ doz...	$3.00	3.75	4.25	4.75	5.25	6 00	7.00	8.00	9.00		

Fuse.—₩ 1000 ft.
Common Hemp Fuse, for dry ground....$2.70
Common Cotton Fuse, for dry ground....2.85
Single Taped Fuse, for wet ground....4.75
Double Taped Fuse, for very wet ground....6.00
Triple Taped Fuse, for very wet ground....7.25
Small Gutta Percha Fuse, for water....7.50
Large Gutta Percha Fuse, for water....12.00

Gauges.
Marking Mortise, &c....dis 60&10 %
Starrett's Surface, Center and Scratch....dis 25&10 %
Wire, low list....dis 10&10 @
Wire, Wheeler, Madden & Co....dis 10 %
Wire, Morse's....dis 50 @ 50&5 %
Wire, Brown & Sharpe's....dis 10 @ 20 %

Gimlets.—Nail and Spike....dis 50&10&5 %
"Eureka" Gimlets....dis 40&10 %
"Diamond" Gimlets....₩ gross $5.00
Double Cut, Shepardson's....dis 45 @ 45&5 %
Double Cut, Ives'....dis 60 @ 60&5 %
Double Cut, Douglass'....dis 40&10 %
"Hee"....₩ gross $12, dis 25 @ 25&5 %

Glue.—Le Page's Liquid....dis 25 @ 25&5 %
Upton's Liquid....dis 35 %
Le Page Co.'s Nameless Glue....dis 25 @ 25&5 %

Glue Pots.
Tinned and Enameled....dis 40&5 @ 40&10%
Family, Howe's "Eureka"....dis 40 %
Family, L. F. & C.'s "Handy"....dis 50 %

Grindstones
Small, at factory....₩ ton $7.50 @ 9.0

Grindstone Fixtures.
Sargent's Patent....dis 70&10 %
Reading Hardware Co....dis 30&10 %

Hack Saws.—See Saws.

Halters.—Covert's, Rope, ¼-in. Jute....dis 50&2 %
Covert's, Rope, ¼-in., Hemp....dis 40&2 %
Covert's Adj. Rope Halters....dis 40&2 %
Covert's Hemp Horse and Cattle Tie....dis 50&2 %
Covert's Jute Horse and Cattle Ties....dis 60&10&2 %

Hammers.
Handled Hammers.
Maydole's....List Dec. 1, 1885, dis 25 @ 25&1 0%
Buffalo Hammer Co....List Jan. 15, '87
Humason & Beckley....Dis. 50 @ 50&
Atha Tool Co....10 %
Fayette R. Plumb....dis 40&10 @ 50
C. Hammond & Son....dis 40&10&50
Verree....dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75....dis 30&10 %
Nelson Tool Works....dis 40&10 %
Warner & Nobles....dis 20 @ 25 %
Peck, Stow & Wilcox....dis 40 %
Sargent's....dis 33⅓&10 %
Heavy Hammers and Sledges—
3 ℔ and under....₩ ℔ 40¢
3 to 5 ℔....₩ ℔ 36¢ } dis 70 & 10 @ 75 %
Over 5 ℔....₩ ℔ 30¢
Wilkinson's Smiths'....10½¢ @ 11¢ ₩ ℔

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₩ doz...dis 10%
Providence Tool Co. Leg Irons, $25.00 ₩ doz....dis 10 %
Tower's....dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished, ₩ doz, $48: Nickeled, $57; 3 Hands, Polished, ₩ doz, $72; Nickeled, $84....dis 25 %

Handles.
Iron, Wrought or Cast.—
Door or Thumb.

Nos....	0	1	2	3	4
Per doz.	$0.90	1.00	1.18	1.35	1.50

....dis 60&10&10
Roggin's Latches....₩ doz. 30¢ @ ₩
Bronze Iron Drop Latches....₩ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88....net
Barn Door....₩ doz. $1.40, dis 10&10 %
Chest and Lifting....dis 70 %
Handles, Wood—
Saw and Plane....dis 40&10 @ 40&10&5 %
Hammer, Hatchet, Axe, Sledge, &c....dis 35 %
rad Awl....₩ gross $2.00

Hickory Firmer Chisel, assorted....₱ gross 4.50
Hickory Firmer Chisel, large.....₱ gross 5.00
Apple Firmer Chisel, assorted.....₱ gross 5.00 } dis 40 @ 40&10 %
Apple Firmer Chisel, large.....₱ gross 6.00
Socket Firmer Chisel, assorted.....₱ gross 3.00
Socket Framing Chisel, assorted.....₱ gross 5.00
J. B. Smith Co.'s Pat. File.....dis 50 %
File, assorted.....₱ gross 2.75 }
Auger, assorted.....₱ gross 5.00 } dis 40 @ 40&10 %
Auger, large.....₱ gross 7.00 }
Patent Auger, Ives'.....dis 30&10 %
Patent Auger, Douglass'.....₱ set $1.25 net
Patent Auger, Swan's.....₱ set $1.00 net
Hoe, Rake, Shovel, &c.....dis 50&10 %

Cross Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 30¢ No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles.....50¢, dis 60 %
Champion.....15¢

Hangers.
Barn Door, old patterns.....dis 60&10&10 @ 70 %
Barn Door, New Eneland.....dis 60&10&10 @ 70 %
Samson Steel Anti-Friction.....dis 55 %
Orleans Steel.....dis 55 %
Hamilton Wrought Wood Track.....dis 55 %
U. S. Wood Track.....dis 60 %
Champion.....dis 60&10 %
Rider and Wooster, Medina Mfg. Co.'s list....dis 7
Climax Anti-Friction.....dis
Climax Steel Anti-Friction.....dis 50 %
Zenith for Wood Track.....dis 55 %
Reed's Steel Arm.....dis 50 %
Challenge, Barn Door.....dis 50 %
Sterling Improved (Anti-Friction).....dis 55&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18....dis 50&2 %
Cheritree.....dis 50&10 %
Kidder's.....dis 50&10 @ 60 %
The "Boss".....
Best Anti-Friction.....dis 60 %
Duplex (Wood Track).....dis 60 %
Terry's Patent.....₱ dos. dr. 4 in. $10; 5 in., $12.....dis 50&5 %
Cronk's Patent....No. 4, $12; No. 5, $14.40; No. 6, $18.....dis 50&10 @ 60 %
Wood Track Iron Clad.....₱ ft. 10¢, dis 50&15 @ 60 %
Carrier Steel Anti-Friction.....dis50 @ 50&5 %
Architect.....₱ set $6.00, dis 20 %
Eclipse.....dis 20&10
Felix.....₱ set $4.50, dis 20 %
Richards'.....dis30@30&10 %
Lane's Steel Anti-Friction.....dis 40&10 %
The Ball Bearing Door Hanger....dis 20&10 @ 25&10 %
Warner's Patent.....dis 20@20&10 %
Stearns' Anti-Friction.....dis 20 @ 20&10 %
Stearns' Challenge.....dis 25&10 @ 25&10&10 %
Faultless.....dis 40 @ 40&10 %
American.....₱ set $6; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....dis 40 %
Paragon, Nos. 1, 2 and 3.....dis 40&10 %
Paragon, Nos. 5, 5½, 7 and 8.....dis 20&10 %
Crescent.....dis 60@60&10 %
Nickel Cast Iron.....dis 50 %
Nickel, Malleable Iron and Steel.....dis 40 %
Scranton Anti Friction Single Strap.....dis 33⅓ %
Scranton Anti-Friction Double Strap.....dis 40 %
Universal Anti Friction.....dis 40 %
Wild West, 4 in. wheel, $15; 5 in. wheel, $21....dis 45 %
Star.....dis 4 &10 @ 40&10&5 %
May.....dis 50&5 @ 10&10 %

Harness Snaps.—See Snaps.

Hatchets.—List Jan. 1, 1886.

Isaiah Blood.....dis 35 @ 40%
Hunt's Shingling Lath and Claw.....dis 40&10 %
Hunt's Broad.....dis 40 %
Buffalo Hammer Co.....dis 40&10@50 %
Hurd's.....dis 40&10 @ 50 %
Fayette R. Plumb.....dis 40&10 @ 50 %
Wm. Mann, Jr., & Co.....dis 50 @ 50&5%
Underhill Edge Tool Co.....dis 40&5 @ 40&10 %
Underhill's Haines and Bright goods.....dis 33⅓ %
C. Hammond & Son.....dis 40&10 @ 50 %
Simmons.....dis 40&10 @ 50 %
Peck's.....dis 40&10 @ 40&10&5 %
Kelly's.....dis 50@50&5 %
Sargent & Co.....dis 50 %
Ten Eyck Edge Tool Co.....dis 40&10@40&10&5 %
Collins, following list.....dis 10 %
Shingling, Nos. 1 2 3.....₱ doz $5.50 $6.00 $6.50
Claw, Nos. 1 2 3.....₱ doz 6.00 6.50 7.00
Lathing Nos. 1 2 3.....₱ doz 5.50 6.00 6.50

Hay Knives.
Lightning.....Mfrs. price ₱ doz $18, dis 25 % Jobber's Extras
Electric.....₱ doz $17 } dis 30 @ 30&5%
Gem.....₱ doz $18 }
Wadsworth's.....dis 40&7½ @ 40&10 %
Carter's Needle.....₱ doz $11.50 @ $12.00
Heath's.....₱ doz $13.50 @ $14.00

Hinges.
Wrought Iron Hinges—
Strap and T.....dis 70&10&5 @ 70&10&10 %
Screw Hook and Strap. { 6 to 12 in. ₱ ₱..... 3¾¢ / 14 to 20 in., ₱ ₱..... 3½¢ / 22 to 36 in., ₱ ₱..... 2¾¢
Heavy Welded Hook { 6 to 12 in., ₱ ₱..... 3¾¢ / 14 to 20 in., ₱ ₱..... 3½¢ / 22 to 36 in., ₱ ₱..... 2¾¢
Screw Hook and Eye..... { ⅜ in.....₱ doz $1.50 } dis / ⅝ in.....₱ doz $2.45 } 10% / ¾ in.....₱ doz $3.80 }
Rolled Blind Hinges, Nos 232 and 34.....dis 50&10 %
Rolled Blind Hinges, Nos. 232 and 234....dis 55&10 %
Rolled Plate.....dis 70&10 %
Rolled Raised.....dis 70&10 %
Plate Hinges { 8, 10 & 12 in., ₱ ₱..... 5.
"Providence" } over 12 in., ₱ ₱..... 4¢

Spring Hinges—
Geer's Spring and Blank Butts.....dis 40 %
Union Spring Hinge Co.'s list, March, 1886....dis 20 %
Acme and U. S.....dis 30 %
Empire and Crown.....dis 20 %
Hero and Monarch.....dis 50 %
American, Gem, and Star, Japanned.....dis 20 %
American, Gem, and Star, Bronzed.....net
Oxford, Bronze and Brass.....net
Barker's Double Acting.....dis 20&10 %
Union Mfg. Co.....dis 25 %
Bommer's.....dis 30 %
Buckman's.....dis 15@20 %
Chicago.....dis 30 %

Gate Hinges—
Western.....₱ dos $4.40, dis 55 %
N. E.....₱ dos $7.00, dis 55 %
N. E. Reversible.....₱ dos $5.20, dis 55&10 %
Clark's, Nos. 1 2 3.....dis 60&10&5 %
N. Y. State.....₱ dos $5.00, dis 55&10 %
Automatic.....₱ dos $12.50, dis 50 %
Common Sense.....₱ dos pair $4.50, dis 50 %
Seymour's.....dis 45&10 %
Shepard's.....dis 60&10&5 %
Reed's Latch and Hinges.....₱ dos sets $12, dis 50 %

Blind Hinges—
Parker.....dis 75&2 %
Palmer.....dis 50&5&10 %
Seymour.....dis 70&2 %
Nicholson.....dis 45&10 %
Huffer.....dis 50 %
Clark's, Nos. 1, 3, 5, 40 and 50.....dis 75&10&5@80 %
Clark's Mortise Gravity.....dis 50 %
Sargent's, Nos. 1, 3, 5, 11, 13...dis 75&10@75&10&5 %
Sargent's, No. 12.....dis 75&10&10 %
Reading's Gravity.....dis 75&10 @ 75&10&5 %
Shepard's Noiseless Niagara Buffalo, Champion, Steamboat, Clark's Old Pattern and Clark's Tip Pattern.....dis 75&10&5 %
Shepard's O. S, Lull & Porter.....dis 75&10 %
Shepard's Acme, Lull & Porter.....dis 75&5 %
Shepard's Queen City Reversible.....dis 75 %
Clark's Lull & Porter, Nos. 0, 1, 1¼, 2, 2½, 3.....
.....dis 75&10@2½ %
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50....dis 25&2 %

Hoes.
Handled—
Garden, Mortar, &c.....dis 65&5 %
Planter's, Cotton, &c.....dis 65&5 %
Warren Hoe.....dis 60 %
Magic.....₱ dos $4.71

Eye—
D. & H. Scovil.....dis 20 %
Lane's Crescent Scovil Pattern.....dis 45 %
Lane's Crescent Planters Pattern.....dis 45 & 5 %
Lane's Razor Blade, Scovil Pattern.....dis 30 %
Maynard, S. & O. Pat.....dis 45&5 %
Sandusky Tool Co., " "....dis 60 %
Hubbard & Co., " "....dis 60 %
Base " "....dis 60 %
Grub.....dis 60 @ 60&10 %

Hog Rings and Ringers.
Hill's Improved Ringers.....₱ dos. $4.50
Hill's Old Style Ringers.....₱ dos. $3.00
Hill's Tongs.....₱ dos. $4.50
Hill's Rings.....₱ doz boxes, $2.25 @ 2.40
Perfect Rings.....₱ dos boxes $1.75 @ 2.00
Perfect Ringers.....₱ dos. $2.50
Blair's Hog Ringers.....₱ dos. $2.60 @ $2.85
Blair's Hog Rings.....₱ doz 90¢ @ 1.00
Champion Ringers.....₱ dos $2.00
Champion Rings, Double.....₱ dos. $2.25
Brown's Ringers.....₱ dos. $2.00
Brown's Rings.....₱ dos. $1.25 @ 1.50

Hoisting Apparatus
"Moore's" Plain Hoist, with Lock Brake.....dis 20 %
"Moore's" Differential Pulley Block.....dis 40 %

Holders, File and Tool.
Ralz Pat.....₱ doz $4; dis 25 %
Nicholson File Holders.....dis 20 %

Hollow-Ware.
Iron—
Stove Hollow-Ware. Ground...dis 60&10@60&10&5 %
Stove Hollow-Ware. Unground.....dis 70 @ 70&5 %
Enameled and Tinned Hollow-Ware—
Kettles.....dis 70 @ 70&5 %
Oval Boilers, Saucepans & Glue Pots.....
.....dis 40&5 & 40&10 %
Gray Enameled Ware.....dis 50&10 @ 50&10&5 %
Agate and Granite Ware.....dis 25 %
Rustless Hollow-Ware.....dis 50 @ 50&5 %
Galvanized Tea-Kettles—

Inch.....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated—4 mo. or 5 % cash in 30 days.
Reed & Barton.....dis 40&5 %
Meriden Britannia Co.....dis 40&5 %
Simpson, Hall, Miller & Co.....dis 40&5 %
Rogers & Brother.....dis 40&5 %
Hartford Silver Plate Co.....dis 40&5&5 %
William Rogers Mfg. Co.....dis 40&5&5 %

Hooks.
Cast Iron—
Bird Cage. Sargent's list.....dis 60&10&10%
Bird Cage. Reading.....dis 60&10&10 %
Clothes Line. Sargent's list.....dis 60&10&10 %
Clothes Line. Reading list. dis 60&10 @ 60&10&10 %
Ceiling. Sargent's list.....dis55&10&10 %
Harness, Reading list.....dis 55&10 @ 55&10&10 %
Coat and Hat, Sargent's list.....dis 55&10 @ 60&10 %
Coat and Hat, Reading.....dis 50&10 @ 50&10&10 %
Wrought Iron—
Cotton.....₱ dos $1.25
Cotton Pat. (N. Y. Mallet & Handle W'ks).....dis 30 %
Tassel and Picture (T. & S. Mfg. Co.).....dis 50 %
Wrought Staples, Hooks, &c.....See Wrought Goods
Bench Hooks.....See Bench Stops

Wire—
Wire Coat and Hat, Gem, list April, 1886.....dis 45 %
Wire Coat and Hat Miles', list April, 1886.....dis 45 %
Indestructible Coat and Hat.....dis. 45 %
Wire Coat and Hat, Standard.....dis 45 %
Belt.....dis 75&10 @ 80 %
Grass.....₱ dos $2.00
Bush.....dis 55 @ 60 %
Whiffletree—Patent.....dis 55 %
Hooks and Eyes—Malleable Iron.....dis 70 @ 70&10 %
Hooks and Eyes—Brass.....dis 60&10&10 %
Fish Hooks, American.....dis 50 %

Horse Nails.

Nos.	6	7	8	9	10	
Ausable.	28¢	26¢	25¢	24¢	23¢.	dis 25&10@25&10&10 %
Clinton. Fin.	24¢	22¢	21¢	20¢	19¢	dis 40&10 @ 50 %
Essex.	28¢	26¢	25¢	24¢	23¢.	dis25&10@25&10&10
Lyra	25¢	23¢	22¢	21¢	20¢	dis 40&10&2@50 %
Snowden.	25¢	23¢	22¢	21¢	20¢	dis 40&10&5@50 %
Putnam.	24¢	22¢	21¢	20¢	19¢	dis 5&10&2½&2½ %
Vulcan.	23¢	21¢	20¢	19¢	18¢	dis 12½&5
Northwest'n.	25¢	23¢	22¢	21¢	20¢	dis 10&10&5&5 %
Globe.	23¢	21¢	20¢	19¢	18¢	dis 12½&5&5 %
A. C.	25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 33⅓&5 %
C. B. K.	25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 33⅓&5 %
Champlain.	28¢	26¢	25¢	24¢	23¢	dis25&10&10 %
New Haven.	28¢	26¢	25¢	24¢	23¢	dis25&10@25&10&10 %
Saranac.	23¢	21¢	20¢	19¢	18¢	dis 30&10 %
Champion.	25¢	23¢	22¢	21¢	20¢	dis 10&10&10 %
Capewell.	28¢	26¢	25¢	24¢	23¢	dis 35&5 @ 35&10 %
Star.	23¢	21¢	20¢	19¢	18¢	dis 10&10@10&12½ %
Anchor.	23¢	21¢	20¢	19¢	18¢	dis 35 %
Western.	23¢	21¢	20¢	19¢	18¢	dis 40&10 %
Empire Bronzed						14 per lb.

Horse Shoes.—See Shoes, Horse.

Hose, Rubber, competition...75&10 @ 75&10&5 %
Standard.....dis 70&7 &10 %
Extra.....dis 60 @ 60&10 %
N. Y. R. & P. Co., Para.....dis 30&10 %
N. Y. R. & P. Co., Extra.....dis 50 %
N. Y. R. & P. Co., Dundee.....dis 60&10&5 %

Huskers.
Blair's Adjustable.....₱ gross $8.00
Blair's Adjustable Clipper.....₱ gross 7.00

Jack Screws.—See Screws.

Kettles.

	Spun.	Stamped.
Brass, 7 to 17 in., ₱ ₱.....	24¢	21 ¢
Brass larger than 17 inches, ₱ ₱..	26¢	23½¢
Enameled and Tea Kettles.....See *Hollow-Ware*		

Keys.
Lock Asso'n list Dec. 30, 1886.....dis 50&10 @ 60&5 %
Eagle, Cabinet, Trunk and Padlock.....dis 33⅓&2 %
Hotchkiss' Brass Blanks.....dis 40 %
Hotchkiss' Copper and Tinned.....dis 40 %
Hotchkiss' Padlock and Cabinet.....dis 35 %
Ratchet Bed Keys.....₱ doz $4.00, dis 15 %

Knife Sharpeners.
Parkin's Applewood Handles.....₱ doz $6.00, dis 40 %
Parkin's Rosewood or Cocobolo...₱ doz $9.00, dis 40 %

Knives.
Wilson's Butcher Knives.....dis 20 @ 25 %
Ames' Butcher Knives.....dis 25 %
Nichols' Butcher Knives.....dis 40&10 %
Ames' Shoe Knives.....dis 20@25 %
Ames' Bread Knives.....₱ dos $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives.....dis 20 %
Hay and Straw.....See Hay Knives
Table and Pocket.....See Cutlery

Knobs.
Door Mineral.....65@68¢
Door Por. Jap'd.....75@78¢
Door Por. Por. Nickel.....$2.00 @ 2.25
Door Por. Plated, Nickel.....$2.00 @ 2.25
Drawer, Porcelain.....dis 55&10&10@6..&10&10 %
Hemacite Door Knobs, new list.....dis 40&10@50 %
Yale & Towne Wood Knobs, list Dec., 1885....dis 40 %
Furniture Plain.....75¢ gross inch. dis 10 %
Furniture, Wood Screws.....dis 25&10 %
Base, Rubber Tip.....dis 70&10&5 %
Picture, Judd's.....dis 60&10&10 @ 70 %
Picture, Sargent's.....dis 70&10 %
Picture, Hemacite.....dis 35&5 %
Shutter, Porcelain.....dis 65&10 %
Carriage, Japanned.....₱ gross 80¢, dis 60&10 %

Ladles.
Melting, Sargent's.....dis 55&10%
Melting, Reading.....dis 35&10%
Melting, Monroe's Patent.....₱ dos. $4.00, dis 40%
Melting, P. S. & W.....dis 35&10 @ 40%
Melting, Warner's.....dis 30%

Lawn Mowers.
Standard List.....dis 50&10 %
Enterprise.....dis 60&10 %

Lanterns.
Tubular, Plain, with Guards.....₱ doz $4.00 @ $4.25
Tubular, Lift Wire, with Guards...₱ doz $4.50 @ $4.75
Tubular, Square Plain, with Guards, ₱ doz $4.00 @ $4.25
Tubular, Sq Lift Wire, with Guards, ₱ doz $4.25 @ $4.50
Without Guards, 25¢ ₱ dozen less.
Police, Small, $6.00; Med. $7.25; Large, $9.75. dis 20@25 %

Lemon Squeezers.
Porcelain Lined, No. 1.....₱ dos. $6.00, dis 25&30 %
Wood, No. 2.....₱ dos. $3.00, dis 35 %
Wood, Common.....₱ doz $1.70 @ 1.75
Dunlap's Improved.....₱ dos. $3.75, dis 20 %
Jammis'.....No. 1, $5; 2, $9; 12, $18 ₱ dos. dis 25&10 %
Jennings' "Star".....₱ dos $2.50
The "Boss".....₱ dos $2.50
Dean's.....Nos. 1, ₱ dos $6.50; 2, $8.35; 3, $1.90
Little Giant.....dis 50 @ 50&5 %
King.....dis 40&5 %

Linen.
Cotton and Linen Fish, Draper's.....dis 50 %
Draper's Chalk.....dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25..dis 25 %
Cotton Chalk.....dis 55 %
Samson, Cotton, No. 4, $2; No. 4½, $2.50.....dis 10 %
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gross.....dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton.....dis 45
Wire Clothes, No. 18, $3.60; No 19, $3.00; No. 20, $2.50.
Ventilator Cord, Samson Braided, White or Drab Cotton.....$7.50 ₱ doz. dis 20%

Locks, Padlocks, Cabinet Locks, &c.
Door Locks, Latches, &c.—
List Dec. 30, '86, chgd Feb. 2, '87...dis 50&10 @ 60&5 %
Mallory, Wheeler Co., list, July, 1888..dis 50&10@60 %
Sargent & Co. list Aug 1, 1888, dis 55&2&10@60&10 %
Reading Hardware Co. (list Feb. 2, '88), dis 55@60&10 %
Livingston & Co.....dis 70 %
Note.—Lower net prices often made.
Perkins' Burglar Proof.....dis 60&25 %
Plate.....dis 33⅓&2 %
F. Many's "Extension Cylinder".....$10.50 ₱ doz
Barnes Mfg. Co.....dis 40 %
Yale Corrugated Key.....dis 33⅓ %
Dietz Flat Key.....dis 30 %
L. & C. Round Key Latches.....dis 30&10 %
L. & C. Flat Key Latches.....dis 33⅓&10 %
Romer's Night Latches.....dis 15 %
Yale new list.....dis 33⅓ %
"Shepardson" or "U. S."..... 1is 35 %
'Felter" or 'American".....dis 40&10 %
Seed's N. Y. Hasp Lock.....dis 25 %
Cabinet—
Eagle, Gaylord Parker and Corbin, } List March, '84, revised Jan. 1, '85. dis 33⅓&2 %
Deitz, Nos. 36 to 39.....dis 40 %
Deitz, Nos. 51 to 63.....dis 40 &10 %
Dietz, Nos. 86 to 96.....dis 30 %
Stoddard Lock Co.....dis 30 @ 33⅓ %
"Champion" Night Latches.....dis 40 %
Barnes Mfg. Co.....dis 40 %
Eagle and Corbin Trunk.....dis 25&2 %
Champion" Cabinet and Combination....dis 33⅓ %
Yale.....dis 33⅓ %
Romer's.....dis 25 %
Padlocks—
List, Dec. 23, 84.....dis 75 @ 75&10 %
Yale Lock Mfg. Co.'s.....dis 33⅓ %
Eagle.....dis 25&2 %
Eureka, Eagle Lock Co.....dis 40&2 %
Romer's, Nos. 0 to 91.....dis 30 %
Romer's Scandinavian, &c, Nos. 100 to 605....dis 15 %
A. E. Dietz.....dis 40 %
"Champion" Padlocks.....dis 40 %
Hotchkiss.....dis 30 %
'Star".....dis 45 %
"Horse Shoe."₱ dos. $9.....dis 40 %
Barnes Mfg. Co.....dis 40 %
Nock's.....dis 30 %
Brown's Patent.....dis 25 %
Scandinavian.....dis 90 @ 90&10 %
Vralm's Pat. Scandinavian new list (low)....dis 80 %

Lumber Tools.
Ring Peavies, "Blue Line" Finish.....₱ dos $20.00
Ring Peaves, Common Finish.....₱ dos $18.00
Steel Socket Peavies.....₱ dos $21.00
Mall. Iron Socket Peavies.....₱ dos $19.00
Cant Hooks, "Blue Line" Finish.....₱ dos $16.00
Cant Hooks, Common Finish.....₱ dos $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....₱ dos $16.00
Cant Hooks, Mall. Socket Clasp Common Finish.....₱ dos $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish..₱ dos $14.00
Cant Hooks, Clip Clasp, Common Finish..₱ dos $12.00
Hand Spikes.....₱ dos 6 ft., $15.00; 8 ft., $20
Pike Poles, Pike & Hook, 12 ft. 14 ft. 16 ft. 18 ft. 20 ft. ₱ dos.....$11.50 12.50 14.50 17.50 21.50
Pike Poles, Pike only, ₱ dos.....10.00 11.00 13.00 16.00 20.00
Pike Poles, not Ironed, ₱ dos.....6.00 7.00 9.00 12.00 16.0
Setting Poles, ₱ dos.....14.00 15.00 17.00
Swamp Hooks.....₱ dos $13.00

Lustre.
Four-ounce Bottles.....₱ doz. $1.75 ₱ gro. $17.00

Mallets.
Hickory.....dis 20&10@20&10&10 %
Lignumvitæ.....dis 20&10@20&10&10 %
B. & L. Block Co, Hickory and L. V....dis 30 @ 30&10 %

Match Safes.
Dangerfield's Self-Igniting.....₱ doz $12

Mattocks.—Regular list.....dis 60&10 @ 60&10&5 %

Meat Cutters

Dixon's—Nos.	1	2	3	4	
₱ dos.....	$14.00	17.00	19.00	30.00	dis 40&5 %
Woodruff's.....	Nos.	100	150		
	₱ dos.	$15.00	18.00		dis 40&5 %
Champion.....	Nos.	200	300	400	
	₱ dos.	$22.00	27.00	40.00	dis 40&5 %

Hales' Pattern Nos.	11	12	13	
₱ dos...	$27.00	33.00	45.00	dis 70 & 70&5 %

American.....					dis
Nos.....	1	2	3	4B	
Each.....	$5.00	7.00	10.00	25.00	50.00 60.00
Enterprise.....					dis 30 %
Nos.....	10	12	22	32	42
Each.....	$3.	2.50	4.00	6 00	15 00

Pennsylvania.....dis 40&10%
Nos. 1 2 3 00
₩ dos. $24.00 28.00 36.00 28.00
Miles' Challenge..Nos. 1 2
₩ dos. $32.00 30.00 40.00—dis 45@45&10 %
Home No. 1.....₩ dos, dis 55&10 %
Draw Cut..Nos. 5 3 2 1
Each...$50.00 75.00 80.00 225.00—dis 20 @ 25 %
Beef Shavers (Enterprise Mfg. Co.)...dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter.....₩ doz. $66.00

Mincing Knives.
Am. (3d quality), ₩ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....dis 20&10 %
Smith's, ₩ dos, Single, $2.00; Double, $3...dis 40@45 %
Knapp & Cowles.....dis 50&10@60 %
Buffalo Adjustable.....₩ doz $3.00, dis 25 %

Molasses Gates.—Stebbins' Pat..dis 70@70 & 7½ %
Stebbins' Genuine.....dis 60&10&10 %
Stebbins' Tinned Ends.....dis 40&10 %
Chase's Hard Metal.....dis 50&20 %
Bush's.....dis 20 %
Lincoln's Pattern.....dis 70 @ 70&10 %
Weed's.....dis 20&10 %
Sizes Nos. 1 2 3 4
$7.00 8.00 9.00 10.00, ₩ dos, dis 60&10&10 %

Money Drawers.—₩ doz., $18 @ $20.

Muzzles.—Safety, ₩ dos. $4.....dis 25 %

Nails.....See Trade Report
Wire Nails & Brads, list July 14, '87...dis 70&10 %
Wire Nails, Standard Penny.....₩ keg, $2.60 @ $2.70

Nail Puller.—Curtiss' Hammer...₩ dos $9.00 net
Giant, No. 1.....₩ dos $30.00, dis 10 %
Pelican.....₩ dos $9.00, dis 25 %
Boss.....₩ dos $30, dis 30 %

Nail Sets.—Square.....₩ gro., $4.00 @ $4.25
Round.....₩ gro., $3.25
Cannon's Diamond Point.....₩ gro. $12 dis 20 %

Nut Crackers.
Table (Humason & Beckley Mfg. Co.).....dis 40 %
Blake's Pattern.....₩ dos $2.00, dis 10 %
Turner & Seymour Mfg. Co.....dis 50 %

Nuts
Nuts, all kinds, 5¼¢ off list Jan. 1, 1888.
In lots less than 100 ℔, ₩ ℔, add ¼¢, 1 ℔ boxes add 1¢ to list.

Oakum.
Government.....₩ ℔ 8¢
U. S. Navy.....₩ ℔ 7¢
Navy.....₩ ℔ 6¢ @ 6¼¢

Oilers.—Zinc and Tin.....dis 65 @ 65&10 %
Brass and Copper.....dis 60&10@50&10&5 %
Malleable, Hammers' Improved, No 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz.....dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list...dis 40 %
Prior's Patent or "Paragon" Zinc.....dis 60&10&10 %
Prior's Patent or "Paragon" Brass.....dis 50 %
Olmstead's Tin and Zinc.....dis 60 %
Olmstead's Brass and Copper.....dis 50 %
Broughton's Zinc.....dis 60 %
Broughton's Brass.....dis 50 %

Packing, Steam

Rubber—
Standard.....dis 60&10 @ 60&10&10 %
Extra.....dis 50&10 @ 60 %
N. Y. B. & P. Co., Standard.....dis 50&10&5 %
N. Y. B. & P. Co., Empire.....dis 70 %
N. Y. B. & P. Co., Salamander.....₩ ℔ 65¢, dis 30 %
Jenkins' Standard.....₩ ℔ 80¢, dis 35 %

Miscellaneous—
American Packing.....10¢ @ 11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....18 @ 14¢ ₩ ℔
Cotton Packing.....16 @ 17¢ ₩ ℔
Jute.....7 @ 8¢ ₩ ℔

Padlocks.—See Locks.

Pails
Galvanized Iron—

	Quarts.	10	12	14
Hill's Light Weight, ₩ doz.		$2.75	3.00	3.25
Hill's Heavy Weight, ₩ doz.		3.00	3.25	3.75
Whiting's		2.75	3.00	3.25
Sidney Shepard & Co		2.80	....	3.40
Iron Clad		2.75	3.00	3.25
Fire Buckets		2.75	3.25	3.50

Buckets, see Well Buckets

Indurated Fibre Ware—
Star Pails, 12 qt.....₩ doz $4.50
Fire Stable and Milk, 14 qt.....₩ doz $5.50

Pencils Faber's Carpenters'.....high list, dis 50 %
Faber's Round Gilt.....₩ gro $5.25 net
Dixon's Lead.....₩ gro $4.50 net
Dixon's Lumber.....₩ gro $6.75 net
Dixon's Carpenters'.....dis 40&10 %

Picks.
Railroad, 5 to 6, $12.00; 6 to 7, $13, dis 60&10@60&10&5 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13, dis 60&10@60&10&5 %

Picture Nails.
Brass Head, Sargent's list.....dis 50&10&10 %
Brass Head, Combination list.....dis 50&10 %
Porcelain Head, Sargent's list.....dis 50&10&10 %
Porcelain Head, Combination list.....dis 40&10 %
Niles' Patent.....dis 40 %

Pinking Irons.....₩ dos 65¢ net

Pipe, Wrought Iron.—List March 23, 1887.
1¼ and under, Plain.....dis 55 %
1¼ and under, Galvanized.....dis 47½ %
1¼ and over, Plain.....dis 65 %
1¼ and over, Galvanized.....dis 55 %
Boiler Tubes, Iron.....dis 65 %

Planes and Plane Irons.
Wood Planes—
Molding.....dis 50&5 @ 50&10 %
Bench, First Quality.....dis 50&10 @ 60 %
Bench, Second Quality.....dis 60&10 @ 60&10&5 %
Bailey's (Stanley R. & L. Co.).....dis 30&10 %
Iron Planes—
Bailey's (Stanley R. & L. Co.)...dis 30&10@30&10&5 %
Miscellaneous Planes (Stanley R. & L. Co.)dis 20&10 %
Victor Planes (Stanley R. & L. Co.)....dis 20& 10 %
Steer's Iron Planes.....dis 35 @ 35&5 %
Meriden Mal. Iron Co.'s.....dis 30&10@30&10&10 %
Davis's Iron Planes.....dis 30&10@30&10&10 %
Birmingham Plane Co.....dis 50@50&5 %
Gage Tool Co.'s Self-Setting.....dis 2 %
Chaplin's Iron Planes.....dis 40 @ 40&5 %
Sargent's.....dis 30&10 @ 30& 0&10 %
Plane Irons—
Plane Irons.....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to £
Plane Irons, Buck Bros.....dis 30 %
Plane Irons, Auburn Tool Co.'s "Thistle"....dis 40 %
Plane Irons, Middlesex Mfg. Co. "Baldwin Iron,"
Single and Cut.....dis 20 @ 25 %
Double.....dis 33⅓ @ 40 %
L. & I. J. White.....dis 25 %

Pliers and Nippers.
Button's Patent.....dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 6 in., $13.50; No. 4, 7 in., $21.00 ₩ dos dis 20&10@33⅓ %
Humason & Beckley Mfg. Co.....dis 50@50&7½ %
Gas Pliers.....dis 60 %
Gas Pliers, Custer's Nickel Plated.....dis 60&5 %
Eureka Pliers and Nippers.....dis 40 %
Russell's Parallel.....dis 25 %
P. S. & W. Cast Steel.....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %
Carew's Pat. Wire Cutters.....dis 20 %
Morrill's Parallel, per doz., $12.....dis 30&5 %
Cronk's 8 in., $15; 10 in., $21.....dis 40 @ 40&5 %

Plumbs and Levels.
Regular List.....dis 70&10@70&10&10 %
Disston's.....dis 45&10 %
Pocket Levels.....dis 70&10@70&10&10 %
Davis Iron Levels.....dis 30 %
Davis' Inclinometers.....dis 10&10 %

Poppers, Corn.
Round or Square, 1 qt.....₩ gro $12 @ $15
Round or Square, 2 qt.....₩ gro $25 @ $26

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger.....₩ doz $36.00, dis 25&10 %
Fletcher Post Hole Augers.....₩ doz $36.00, dis 20 %
Eureka Diggers.....₩ doz $16 @ $17
Leed's.....₩ doz $8.00 @ $9.00
Vaughan's Post Hole, Auger, per doz....$13 00 @ $14.00
Kohler's Little Giant.....₩ doz $18.00
Kohler's Hercules.....₩ doz $15.00
Kohler's New Champion.....₩ doz $9.00
Schneidler.....₩ doz $18
Ryan's Post Hole Diggers.....₩ doz $24
Cronk's Post Bars.....doz $60, dis 50&5 @ 50&10 %
Gibb's Post Hole Digger, ₩ doz $30....dis 40 @ 40&10 %

Potato Parers.
White Mountain.....₩ doz $5.00 @ 5.50
Antrim Combination.....₩ doz $8.00
Hoosier.....₩ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, ₩ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....₩ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Prunin Tools.....dis 40 %
Pruning Shears, Henry Pat...₩ doz $3.75 @ $4.00 net
Henry's Pruning Shears.....₩ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination...₩ doz $12, dis 20 %
Dunlap's Saw and Chisel.....₩ doz $8.50, dis 30 %
J. Mallinson & Co.....No. 1, $5.25; No. 2, $7.25

Pulleys.—Hot House, Awning, &c.....dis 60&10 %
Japanned Screw.....dis 60&10 %
Brass Screw.....dis 60&10 %
Japanned Side.....dis 66⅔&10 %
Japanned Clothes Line.....dis 60&10 %
Empire Sash Pulley.....dis 55 @ 60 %
Moore's Sash, Anti Friction.....dis 50 %

Hay Fork, Solid Eye, $4.00; Swivel, $4.50 (dis 50&10 @ 50&10&5 %
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70...dis 50 %
Hay Fork, "F" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron.....dis 20 %
Hay Fork, Reed's Self-Lubricating.....dis 60 %
Shade Rack.....dis 45 %
Tackle Blocks.....See Blocks

Pumps.—Cistern, Best Makers.....dis 50 @ 10&60 %
Pitcher Spout, Best Makers...dis 60&10 @ 60&10&10 %
Pitcher Spout, Cheaper Goods..dis 70&5 @ 70&10&5 %

Punches.
Saddlers' or Drive, good quality.....₩ doz 60¢ @ 65¢
Semis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Semis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring, good quality.....₩ doz $2.50 @ $2.60
Spring, Leach's Patent.....dis 15 %
Semis & Call Co.'s Spring and Check.....dis 40 %
Solid Tinners'.....₩ doz $1.44, dis 55 %
Tinners' Hollow Punches.....dis 20&2 %
Rice Hand Punches.....dis 15 %

Rail.
Sliding Door, Wrt. Brass ₩ ℔ 35¢.....dis 15 %
Sliding Door, Bronzed Wrt. Iron.....₩ foot 7¢
Sliding Door Iron, Painted.....₩ foot 4¢. dis 20&10&5 %
Barn Door, Light....Inch. ¾ ⅝ 1
Per 100 feet.....$2.50 3.00 4.40—dis 10 %
4 ℔ for N. E. Hangers—

	Small.	Med.	Large
Per 100 feet	$2.15	2.70	3.25 net
Terry's Wrought Iron, ₩ foot			4¾¢ @ 5¢
Victor Track Rail, 7¢ ₩ foot			..dis 50&2 %
Carrier Steel Rail, per foot			4½¢

Rakes.
Cast Steel, Association goods.....dis 65&5 %
Cast Steel, outside goods.....dis 60&10 @ 70 %
Malleable.....dis 70 @ 70&5 %
Gibbs Lawn Rake.....$12, dis 40 %
Canton Lawn Rake.....$9, dis 40 %
Ft. Madison Pole Bow Brace and Peerless..dis 65&5 %
Fort Madison Steel Tooth Lawn Rake, $6.....dis 25 %

Razors.—J. R. Torrey Razor Co.....dis 20%
Wostenholme and Butcher.....$10 to £, dis 10 %

Razor Strops.
Genuine Emerson.....dis 60 @ 60&5 %
Imitation Emerson.....₩ doz $2.00, dis 20&10&5 %
Torrey's.....dis 20 %
Badger's Belt and Combination.....₩ doz $2
Lamont Combination.....₩ doz $4

Rivets and Burrs.
Copper.....dis 50 @ 50&10 %
Iron, list November 17, 1887.....dis 50 @ 50&7½ %

River Nets.....dis 50&2 @ 50&10 %

Rods.—Stair, Brass.....dis 2b&2 %
Stair Black Walnut.....₩ doz 40¢

Rollers
Barn Door, Sargent's list.....dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %
Union Barn Door Roller.....dis 70 %

Rope.—Manufacturers' prices for large lots.
Manila.....⅝ inch and larger ₩ ℔ 11¼¢ net
Manila.....⅝ inch ₩ ℔ 11¾¢ net
Manila.....½ and 5-16 inch ₩ ℔ 12¼¢ net
Manila Tarred Rope.....₩ ℔ 10¾¢ net
Manila, Hay Rope.....₩ ℔ 11¼¢ net
Sisal.....⅝ inch and larger ₩ ℔ 9¼¢ net
Sisal.....⅝ inch ₩ ℔ 9¾¢ net
Sisal.....½ and 5-16 inch ₩ ℔ 10¼¢ net
Sisal, Hay Rope.....₩ ℔ 9¼¢ net
Sisal, Tarred Rope.....₩ ℔ 8¾¢ net
Sisal, Medium Lath Yarn.....₩ ℔ 8¼¢ net
Cotton Rope.....₩ ℔ 15 @ 18¢ net
Jute Rope.....₩ ℔ 7¢
Discount 1¾ % for cash in 10 days.

Rules
Boxwood.....dis 80&10 @ 80&10&10 %
Ivory.....dis 50 @ 50&10 %
Starrett's Rules and Straight Edges, Steel.dis 25&10 %

Sad Irons.
From 4 to 10, at factory.....₩ 100 ℔ $2.40 @ $2.55
Self-Heating.....₩ doz. $9.00 net
Self Heating, Tailors'.....₩ doz. $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons.....dis 40@40&5 %
Enterprise Star Irons, new list, July 20, 1882....dis 40 %
Combined Fluter and Sad Iron...₩ doz. $15.00, dis 15 %
Fox Reversible, Self Fluter.....₩ doz., $24.00 net
Chinese Laundry (N. E. Butt Co.).....8¼¢, dis 15 %
New England.....8¢, dis 15 %
Mahony's Troy Pol. Irons.....dis 25&5 %
Sensible.....dis 20 @ 20&5 %

Sand and Emery Paper and Cloth.
List April 19, 1886.....dis 20@20&5 %
Sibley's Emery and Crocus Cloth.....dis 30 %

Sash Cord.
Common.....₩ ℔, 10¢ @ 11¢
Patent, good quality.....₩ ℔, 13¢ @ 13½¢
White Cotton Braided, fair quality.....₩ ℔ 28¢ @ 29¢
Common Russia Sash.....₩ ℔ 13½¢
Patent " " .....₩ ℔ 15¢
Cable Laid Italian " .....₩ ℔ 22¢ @ 23¢
India Cable Laid " .....₩ ℔ 13¢
Silver Lake, A Quality, White.....50¢, dis 10&10&5 %
Silver Lake, A Quality, Drab.....55¢, dis 10&10&5 %
Silver Lake, B Quality, White.....50¢, dis 20&10&5 %
Silver Lake, B Quality, Drab.....50¢, dis 20&10&5 %
Silver Lake, C Quality, White (only).....27¢ @ 28¢
Sylvan Spring, Extra Braided, White.....34¢
Sylvan Spring, Extra Braided, Drab.....32¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson, Braided, White Cotton....60¢ dis 30 @ 30&5 %
Samson, Braided, Drab Cotton.....55¢ dis 30 @ 30&5 %
Samson, Braided Italian Hemp....55¢ dis 30 @ 30&5 %
Samson Braided Linen.....80¢ dis 30 @ 30&5

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ₩ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris and Triumph, list Aug. 16, 1886.....dis 60&2 %
Victor.....60&10&3 %
Walker's.....dis 10 %
Attwell Mfg. Co.....dis 25 @ 33⅓ %
Reading.....dis 66⅔&10 @ 66⅔&10&10 %
Hammond's Window Springs.....dis 40 %
Common Sense, Jas. d. Cop'd and Br'sed..₩ gross $4.00
Common Sense, Nickel Plated.....₩ gross $10.00
Universal.....dis 30 %
Kempshall's Gravity.....dis 60 %
Kempshall's Model.....dis 60@60&10 %
Corbin's Daisy, list February 15, 1886.....dis 70 %
Payson's Perfect.....dis 60 @ 60&10 %
Hugunin's New and Improved Adjustable Sash Balances, list Jan. 5, 1887.....dis 25&t &2 %
Hugunin's New Sash Locks, list Jan. 5, '87.dis 25&5&2 %
Stoddard "Practical".....dis 10 %
Iron Patent.....dis 60 %
Lisesche's Nos. 100 & 110, ₩ gro, $8; 105, $10.dis 20&10 %
Davis, Bronze, Barnes Mfg. Co.....dis 50 %
Champion Safety, List March 1, 1888....dis 55@55&5 %
Security.....dis 70%

Sash Weights.
Solid Eyes.....₩ ton $22

Sausage Stuffers or Fillers.
Miles' "Challenge".....₩ dos. $20, dis 50@50&5 %
Perry.....₩ dos. No. 1, $15; No. 0, $21, dis 50@50&5 %
Draw Cut No. 4.....each, $30.00, dis 20 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Oliver's.....dis 40&10 %

Saws.
Disston's Circular....dis 45@45&5 %) Extras some-
Disston's Cross Cuts.dis 45@45&5 %) times given by
Disston's Hand.....dis 25@25&5 %) jobbers.
Atkins' Circular.....dis 50 %
Atkins' Silver Steel Diamond X Cuts.....₩ foot 70¢
Atkins' Special Steel Dexter X Cuts.....₩ foot 50¢
Atkins' Special Steel Diamond X Cuts.....₩ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₩ foot 27 @ 28¢
Atkins' Hollow Back X Cuts.....₩ foot 18¢
Atkins' Shingle, Mulay, Drag, &c.....dis 45 %
W. M. & C., Hand.....dis 30&5 @ 30&10 %
W. M. & C. Champion X Cuts, Regular ₩ foot .24¢@26¢
W. M. & C. X Cuts, Thin Back.....₩ foot 27¢@29¢
Peace Circular and Mill.....dis 45&10 %
Peace Hand Panel and Rip....dis 20&10 @ 20&10&10 %
Peace Cross Cuts, Standard.....₩ foot 25¢
Peace Cross Cuts, Thin Back.....₩ foot 27¢@28¢
Richardson's Circular and Mill.....dis 45 @ 45&10 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢
Hack Saws—
Griffin's Hack Saws, complete.....dis 40&10 @ 50 %
Griffin's Hack Saw, Blades only.....dis 40&10 @ 50 %
Star Hack Saws and Blades.....dis 25 %
Diamond Hack Saws and Blades.....dis 25 %
Eureka and Crescent.....dis 25 %

Saw Frames.
White Vermont.....₩ gro $9 @ $10
Red, Polished, and Varnished....₩ doz $1.50, dis 25 %

Saw Sets.
Stillman's Genuine...₩ dos $5.00 and $7.75, dis 40&5 %
Stillman's Imita..₩ dos $3.25 and $5.25, dis 40&5@40&10%
Common Lever.....₩ dos $2.00, dis 40&5 %
Morrill's No. 1, $15.00; Nos. 3 & 4, $24....dis 40&10@50%
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 @ 20 %
Nash's.....dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 50&5 %
Hart's Patent Lever.....dis 20 %
Disston's, Star, No. 15, $5.50, dis 20&10@20&10&10 %
Atkins' Lever.....per doz No. 1, $6.00; No. 2, $9.60
Atkins' Criterion.....per doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00...dis 40&10 %

Saw Tools.
Atkins Perfection....$15.00; Excelsior $6.00 ₩ doz

Scales.
Hatch, Counter, No. 171, good quality.....₩ doz $21
Hatch, Tea, No. 161.....₩ doz $6.75 @ $7.00
Union Platform, Plain.....$2.10 @ 2.20
Union Platform, Striped.....$2.20 @ 2.30
Chatillon's Grocers' Trip Scales.....dis 50 %
Chatillon's Eureka.....dis 25 %
Chatillon's Favorite.....dis 40 %
Family, Turnbull's.....dis 30@30&10

Scale Beams.
Scale Beams, List of Jan. 12, 82..dis 50&10@50&10&5 %
Chatillon's No. 1.....dis 40 %
Chatillon's No. 2.....dis 50 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.)..$6.50, dis 30&10 %
Box, 1 Handle.....₩ dos $4.00, dis 10 %
Box, 2 Handle.....₩ dos $6.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 50&10@60 %
Ship, Common.....₩ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Window and Door Frames.
Porter's Pat. Window and Door Frame...dis 33⅓&10 %
Screen Corner Irons, Warner's....dis 33⅓ @ 33⅓&10 %
Stearns' Frames and Corners.....dis 25 @ 25&10 %

Screw Drivers.
Douglas Mfg Co.....dis 20&10&10 %
Disston's.....dis 45&10 %
Disston's Patent Excelsior.....dis 45&10 %
Buck Bros.....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 65&10 %
Stanley R. & L. Co.'s Black Handles.....dis 60&10 %
Sargent & Co.'s No. 1 Forged Blade.....dis 60&10&10 %
Sargent & Co.'s Nos. 20, 40 and 60.....dis 66⅔&10&10 %
Knapp & Cowles' No. 1.....dis 60&20 @ 70 %
Knapp & Cowles' No. 1 Extra.....dis 60 @ 60&10 %
Knapp & Cowles' No. 00 & 4.....dis 50&5 @ 50&10&5 %
Stearns'.....dis 25&10&5 %
Gay & Parsons.....dis 35 %
Champion.....dis 25&10 %
Clark's Patent.....dis 30 @ 33⅓ %
Crawford's Adjustable.....dis 30 %
Eilrich's Socket and Ratchet.....dis 25 @ 25&10 %
Allard's Spiral, new list.....dis 25 %
Kolb's Common Sense.....₩ doz $6, dis 25&10 %

Syracuse Screw-Driver Bits.....dis 30 & 30&5 %
Screw Driver Bits.....₩ doz, 50¢ @ 75¢
Screw Driver Bits, Parr's.....₩ gro 6.25
Fray's Hol. Hdle. Sets, No. 3, $12.....dis. 25 @ 25 & 10 %
P. D. & Co.'s, all Steel.....dis 50 %

Screws

Wood Screws—List, Brass, Jan 27; Iron, July 1, 1887
Flat Head Iron.....dis 70 %
Round Head Iron.....dis 65 %
Flat Head Brass.....dis 65 %
Round Head Brass.....dis 60 %
Flat Head Bronze.....dis 65 %
Round Head Bronze.....dis 60 %
} Ex. 10 % often given by jobbers.

Machine—
Flat Head, Iron.....dis 55 %
Round Head, Iron.....dis 50 %

Bench and Hand—
Bench, Iron.....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech.....₩ doz $2.25
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 @ 25&10&5 %

Lag, Blunt Point.....dis 75 @ 75&10 %
Coach and Lag, Gimlet Point.....dis 75 %
Bed.....dis 25&5 %
Hand Rail, Sargent's.....dis 60&10 %
Hand Rail, Humason, Beckley & Co.'s..dis 70&10@75 %
Hand Rail, Am. Screw Co......dis 75 %
Jack Screws, Millers Falls list.....dis 50 @ 50&5 %
Jack Screws, P. S. & W......dis 35 %
Jack Screws, Sargent.....dis 60&10 @ 60&10&5 %
Jack Screws, Stearns'.....dis 40 @ 40&10 %

Scroll Saws.
Lester, complete, $10.00.....dis 2o %
Rogers complete $4.00.....dis 25 %
Barnes' Builders' and Cabinet Makers', $15....dis 25 %

Scythe Snaths.....dis 50&2 %

Shears.
American (Cast) Iron.....dis 75&10 @ 75&10&5 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....₩ dos $3.75
Tinners'.....dis 20&2 %
Seymour's, List, Dec., 1881.dis 60&10&10@60&10&10&5 %
Heinsch's, List, Dec., 1881..dis 60&10&10@60&10&10&5 %
Heinsch's Tailor's Shears.....dis 33⅓&5
First quality C. S. Trimmers.....dis 80@80&10 %
Second quality C. S. Trimmers.dis 80&10@80&10&10 %
Acme Cast Shears.....dis 10&10 %
Diamond Cast Shears.....dis 10 %
Clipper.....dis 10&10 %
Victor Cast Shears.....dis 75&10@75&10&5 %
Howe Bros. & Hulbert, Solid Forged Steel.. dis 40 %
Cleveland Machine Co., Solid Steel Forged.....dis 70 %
Clauss Shear Co., Japanned.....dis 70 %
Clauss Shear Co., Nickeled, same list.....dis 60 %

Sheaves.
Sliding Door—
M. W. & Co., list July, 1888 .. ....dis 50&10 @ 60&5 %
R. & E., list Dec. 18, 1885.....dis 55&2 %
Corbin's list.....dis 60&10&2 %
Patent Roller.....dis 60&10&2 %
Patent Roller, Hatfield's .....dis 75 %
Russell's Anti-Friction, list Dec. 18, 1885..dis 60&2 %
Moore's Anti-Friction.....dis 60 %

Sliding Sawlter—
R. & E. list Dec. 18, 1885.....dis 60&10&2 %
Sargent's list.....dis 60&10 %
Reading list.....dis 60&10&10 %

Ship Tools.
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co......dis 25 %

Shoes, Horse, Mule, &c.
Horse—
Burden's, Perkins', Phœnix, at factory.....$4.00
Mule—Add $1 ₩ keg to above prices.
Ox, Wrought—
Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot.—*Eastern prices, 2¢ off. cash, 5 days.*
Drop, ₩ bag, 25 ℔.....
Drop, ₩ bag, 5 ℔.....
Buck and Chilled, ₩ 25-℔ bag.....
Buck and Chilled, ₩ 5-℔ bag.....
} Market unsettled. See Trade Report.

Shovels and Spades.
Ames' Shovels, Spades, &c., list Nov. 1, 1885....dis 20 %
NOTE.—Jobbers frequently give 5 @ 7½ % extra on above.
Griffith's Black Iron.....dis 50&10 %
Griffith's C. S.....dis 60 @ 60&10 %
Griffith's Solid Cast Steel R. R. Goods.....dis 20 %
Old Colony (Sanford Fork & Tool Co.).....dis 20 %
St. Louis Shovel Co......dis 20 @ 20&7½ %
Hussey, Binns & Co......dis 15 @ 25 %
Hubbard & Co......dis 20@20&7½ %
Lehigh Mfg. Co......dis 50&10 %
Payne Pettebone & Son, list January, 1886....dis 30 %
Remington's (Lowman's Patent), ...dis 30&10 @ 40 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's Steel.....dis 60&5 @ 60&10 %

Shovels and Tongs.
Iron Head.....dis 60&10@60&10&5 %
Brass Head.....dis 60&10&10 %

Skeins, Thimble.
Western list.....dis 75&5 @ 75&10 %
Columbus Wrt. Steel, list Nov. 1, 1887.....dis 20 %
Coldbrookdale Iron Co.....dis 50&10 %
Utica P. S. T. Skeins.....dis 60 %
Utica Turned and Fitted.....dis 35 %

Sieves.
Buffalo Metallic, S. S. & Co., new list,.. dis 50&25&10 %
Barler Flour Sifters.....₩ doz $2.00
Smith's Adjustable Sifters.....₩ doz $2.25
Smith's Adjustable Milk Strainer.....₩ doz $2.00
Smith's Adjustable F. & C. Strainer.....₩ doz $1.75

Sieves, Wooden Rim—	Iron.	Plated.
Mesh 18, Nested, ₩ doz.....	70¢	90¢
Mesh 20, Nested, ₩ doz.....	85¢	$1.00
Mesh 24, Nested, ₩ doz.....	$1.00	1.10

Slates.—School, by case.....dis 50&10 %

Snaps, Harness, &c.
Anchor (T. & S. Mfg Co.).....dis 65 %
Fitch's (Bristol).....dis 50&10 %
Hotchkiss.....dis 10 %
Andrews.....dis 50 %
Sargent's Patent Guarded.....dis 70&10&10 %
German, new list.....dis 40&10 %
Covert.....dis 50&2 %
Covert, New Patent.....dis 50&5&2 %
Covert New R. E......dis 60@2 %
Covered Spring.....dis 60&10&10 %

Soldering Irons.
Covert's Adjustable. list Jan. 1, 1886.....dis 35&2 %

Spoke Shaves.—Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.).....dis 40&10 %
Stearns'.....dis 20&10 @ 30 %

Spoke Trimmers.
Bonney's.....₩ dos $10.00, dis 50 %
Stearns'.....dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ dos, dis 55&10 %
Douglass'.....₩ dos $9.00, dis 20 %

Spoons and Forks.
Tinned Iron—
Basting, Central Stamping Co.'s list.....dis 70&10 %
Solid Table and Tea, Central Stamping Company's list.....dis 70&10 %
Buffalo, S. S. & Co.....dis 33⅓&2 %
Silver-Plated—4 mos. or 5 % cash 30 days.
Meriden Brit. Co., Rogers.....dis 50 %
C. Rogers & Bros.....dis 50 %
Rogers & Bro.....50 %
Reed & Barton.....dis 50 %
Wm. Rogers Mfg. Co.....dis 50&10 @ 50&10&5 %
Simpson, Hall, Miller & Co.....dis 50&10 %
Holmes & Edwards Silver Co..dis 50&10 @ 50&10&5 %
H. & E. Silver Co. Mexican Silver.....dis 50&5 %
H. & E. Silver Co., Durham Silver.....dis 50&5 %
German Silver.....dis 50 @ 50&5 %
German Silver, Hall & Elton.....dis 50 & 5, cash
Nickel Silver.....dis 50&5@50&10&5 %, cash
Britannia.....dis 60 %
Boardman's Flat Ware.....dis 50&10 %
Boardman's Nickel Silver.....dis 50 %
Boardman's Brit'nia Spoons, case lots.....dis 60 %

Springs.
Elliptic, Concord, Platform and Half Scroll.....dis 60 @ 60&5 %
Cliff & Bolster Springs.....dis 25 %

Squares.
Steel and Iron.....
Nickel-Plated.....
} dis 75 @ 80 %
Try Square and T Bevels.....dis 60&10&10 @ 70 %
Disston's Try Square and T Bevels.....dis 45&10 %
Winterbottom's Try and Miter.....dis 30&10 %
Starrett's Micrometer Caliper Squares.....dis 25 %

Stapters.
Fence Staples, Galvanized } Same price as Barb Wire.
Fence Staples, Plain } See Trade Report.

Steelyards.
Stocks and Dies.
Blacksmith's, Waterford Goods.....dis 30&5 @ 30&10 %
Lightning Screw Plate.....dis 25 @ 30 %
Reece's New Screw Plates.....dis 33⅓ @ 33⅓&5 %

Stone.
Hindostan No. 1, 3¢; Axe, 5½¢; Slips No. 1, 5¢.
Sand Stone.....₩ ℔, 2¢
Washita Stone, Extra.....₩ ℔, 2 ½ @ 22¢
Washita Stone, No. 1.....₩ ℔, 15 @ 16¢
Washita Stone, No. 2.....₩ ℔, 11 @ 12¢
Washita Slips, No. 1, Extra.....₩ ℔, 40 @ 42¢
Washita Slips, No. 1.....₩ ℔, 30 @ 32¢
Arkansas Stone, No. 1, 4 to 6 in.....₩ ℔, $1.35
Arkansas Stone, No. 1, 6 to 9 in.....₩ ℔, $1.75
Turkey Oil Stone.....4 to 8 in., ₩ ℔, 40¢
Turkey Slips.....₩ ℔, $1.00 @ $1.50
Lake Superior, Chase.....₩ ℔, 16¢
Lake Superior Slips, Chase.....₩ ℔, 31@32¢
Seneca Stone, Red Paper Brand, ₩ ℔.....18 @ 20¢
Seneca Stone, High Rounds, ₩ ℔.....20 @ 25¢
Seneca Stone, Small Wheels, ₩ gro.....$24.00

Stove Polish.—Joseph Dixon's..₩ gro $6, dis 10 %
Gem.....₩ gro $4.50, dis 10 %
Gold Medal.....₩ gro $6.00, dis 25 %
"Mirror".....₩ gro $6.00, dis — %
Lustro.....₩ gro $4.75 net
Ruby.....₩ gro $3.75 net
Rising Sun, 5 gro. lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢ net
Boynton's Noon Day, ₩ gro......$5.00
Parlor Grate Stove Enamel.....₩ gross, $13

Yates' Liquid,

₩ gal.,	2	3	5	10 gal. cans
	$0.90	.80	.70	.60

Yates Standard Paste Polish, 10-lb cans, per lb., 15 ¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K Enamel.....₩ gro $19.00
Bonnell's Liquid Stove Polish.....₩ gro $4.00
Bonnell's Paste Stove Polish.....₩ gro $6.00

Tacks, Brads, &c.
List, Jan. 2, 1888.
American Iron Carpet Tacks.....dis 72½&10&2 %
Steel Carpet Tacks.....dis 72½&10&2 %
Swedes Iron Carpet Tacks.....dis 72½&10&2 %
American Iron Cut Tacks.....dis 70&10&2 %
Swedes Iron Tacks.....dis 67½&10&2 %
Swedes Iron Upholsterers' Tacks...dis 67½&10&2 %
Tinned Swedes Iron Tacks.....dis 67½&10&2 %
Tin'd Sw'des Iron Uphol'ers' Tacks..dis 67½&10&2 %
Gimp and Lace Tacks.....dis 67½&10&2 %
Tinned Gimp and Lace Tacks.....dis 67½&10&2 %
Swedes Iron Trimmers' Tacks.....dis 67½&10&2 %
Swedes Iron Miners' Tacks.....dis 67½&10&2 %
Swedes Iron Bill Posters' or Railroad Tacks.....dis 67½&10&2 %
Swedes Steel Tacks, all kinds (Swedes Iron price list).....dis 72½&10&2 %
Copper tacks.....dis 33⅓&10&2 %
Copper Finishing Trunk and Clout Nails.....d's 33⅓&10&2 %
Finishing Nails.....dis 60&10&2 %
Trunk and Clout Nails.....dis 60&10&2 %
Tinned Trunk and Clout Nails.....dis 60&10&2 %
Basket Nails.....dis 60&10&2 %
Common and Patent Brads.....dis 60&10&2 %
Hungarian Nails.....dis 60&10&2 %
Chair Nails.....dis 60&10&2 %
Zinc Glaizers' Points.....dis 40&10&2 %
Cigar Box Nails.....dis 45&10&2 %
Picture-Frame Points.....dis 45&10&2 %
Looking-Glass Tacks.....dis 45&10&2 %
Leathered Carpet Tacks.....dis 45&10&2 %
Brush Tacks.....dis 45&10&2 %
Shoe Finders'.....List Jan. 2, 1888, dis 10 @ 10&5 %
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered.....dis 30&10&10 %
Japanned.....dis 20&10&10 %
Double-pointed Tacks.....85 %
Wire Carpet Nails.....dis 50&10 %
Wire Brads and Nails.....See Nails, Wire
Steel Wire Brads, R. & E. Mfg. Co.'s list....dis 50&10 %

Tap Borers.—Common and Rose.....dis 20&10 %
Ives' Tap Borers.....dis 33⅓&5 %
Thimble Skeins.—See Skeins.
Ties, Bale.—Steel Wire, Stan'd list..dis 50&10&5 %

Tinners' Shears, &c.
Shears and Snips (P. S. & W.).....dis 20 @ 25 %
Punches—See Punches.
Snips, J. Mallinson & Co......dis 33⅓%

Tinware.
Stamped, Japanned & Pieced, list Jan. 20, 18.....dis 70&10 @ 70&10&5 %

Tire Benders, Upsetters, &c.
Stoddard's Lightning Tire Upsetters.....dis 15 %
Detroit Perfected Tire Bender.....dis 15 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20&10 @ 30 %
Wood Bottom.....₩ doz $5.00 @ $5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s.....₩ doz $18.00, dis 50 @ 55 %
Wilson's.....dis 55 %
Sargent's.....₩ doz $24, dis 55&10 %
Acme.....₩ doz $20.00, dis 40 %

Transom Lifters
Wollensak's Patent Iron Bronsed.....dis 50 %
Reiher's Bronzed Iron Rods list Jan. 1, 1887.dis 50&2 %
Reiher's Real Bronze or Nickel Plate, list Jan. 1, 1887.....dis 50&2 %
Excelsior.....dis 50&10&2 %
Shaw's.....dis 50&10 %
Payson's Universal.....dis 40 @ 40&10 %
Crown and Star.....dis 50 %

Traps.
Game—
Newhouse.....dis 35 @ 40&5 %
Oneida Pattern.....dis 70 @ 70&5 %
Game, Blake's Patent.....dis 40&10&5 %
Mouse and Rat—
Mouse, Wood, Choker.....₩ dos holes, 11@12¢
Mouse, Round Wire.....₩ dos $1.50, dis 10 %
Mouse, Cage, Wire.....₩ dos $2.50, dis 10 %
Mouse, Catch-'em-alive.....₩ dos $2.50, dis 15 %
Mouse, "Bonanza".....₩ gross $10 net
Mouse, Delusion.....₩ gross $18.00, dis 15 %
Rat, "Decoy".....₩ gross $10.00, dis 10 %
Ideal.....₩ gross $10
Cyclone.....₩ gross $5.25
Hotchkiss Metallic Mouse, 5-hole traps....₩ doz 90¢
In full cases.....₩ doz 75¢

Trowels.—Lothrop's Brick and Plastering..dis 25 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 25 @ 25&10 %
Peace's Plastering.....dis 25 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 @ 20 %
Brade's Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 70 %

Triers.—Butter and Cheese.....dis 25 %

Trucks, Warehouse, &c.
B. & L. Block Co.'s list, 1882.....dis 40 %

Tubes, Boiler.—See Pipe

Twine.

	BC.	B.
No. 9, Flax Twine, ¼ and ½ ℔ Balls....22¢	30¢	..
No. 12, " " ¼ and ½ " ....21¢	29¢	..
No. 18, " " ¼ and ½ " ....18¢	28¢	..
No. 24, " " ¼ and ½ " ....18¢	28¢	..
No. 36, " " ¼ and ½ " ....16¢	27¢	..
No. 264, Mattrass, ¼ and ½ "	48 @ 50¢	
Chalk Line, Cotton, ½ ℔ Balls	.25¢	
Mason Line, Linen, ½ "	.55¢	
2 Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)	11½¢	
3 Ply Hemp, 1 ℔ Balls	12 @ 12½¢	
3-Ply Hemp, 1½ ℔ Balls	11 @ 11½¢	
Cotton Wrapping, 5 Balls to ℔	15¢ @ 18¢	
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls	10¢	
Wool	6½¢ @ 6¾¢	
Paper	13¢ @ 14¢	
Cotton Mops—6, 9, 12 and 15 ℔ to doz	18¢	

Vises.
Solid Box.....dis 60 @ 60&5 %
Parallel—
Fisher & Norris Double Screw.....dis 15&10 %
Stephens'.....dis 25 @ 30 %
Parker's.....dis 20 @ 25 %
Wilson's.....dis 55 %
Howard's.....dis 40 %
Bonney's.....dis 40&10 %
Millers Falls.....dis 40 @ 40&10 %
Trenton.....dis 40&5 - 40&10 %
Merrill's.....dis 15@20 %
Sargent's.....dis 60&10&10 %
Backus and Union.....dis 40 %
Double Screw Leg.....dis 15&10 %
Prentiss.....dis 20&5 @ 25 %
Simpson's Adjustable.....dis 40 %
Saw Filers—
Bonney's, Nos. 2 & 3.....₩ dos $15.00, dis 4 &10 %
Stearn's.....dis 33⅓&10 @ 33⅓&10&10 %
Stearn's Silent Saw Vises.....dis 33⅓ @ 35 %
Sargent's.....dis 66⅔&10 %
Hopkins.....₩ dos $17.50, dis 10 %
Reading.....dis 40&10 %
Wentworth.....dis 20&10 %
Combination Hand Vise.....₩ gro, $42.00
Cowell Hand Vises.....dis 20 %
Bauer's Pipe Vises.....dis 10 %

Wagon Boxes.
Per lb.
Wagon Jacks.—Daisy.....₩ doz $4 00, dis 25 %

Washer Cutters.
Smith's Patent.....₩ dos $12.00, dis 20&10&10 %
Johnson's.....₩ dos $11.00, dis 33⅓ %
Penny's.....₩ dos Pol. $14; Jap'd, $16, dis 50 %
Appleton's.....₩ dos $16.00, dis 60&10 %
Bonney's.....dis 30&10 %

Washers.

Size	¼	5-16	⅜	½	⅝	¾	1
Washers	7	5¾	4¾	3¾	2¾	2¼	1¾

In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list

Wedges.—Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 4 ¢

Well Buckets, Galvanized.
Hill's.....₩ doz., 12 qt., $4.25; 14 qt., $5.25
Iron Clad.....₩ doz., 14 qt., $4.25 @ $4.50
Whiting's Flat Iron Band.....₩ doz $4.25 @ $4.50
Whiting's Wired Top.....₩ doz $4.00 @ $4.25

Well Wheels—8 in., $2.25; 10 in., $2.70; 12 in., $3.25.

Wire.
Iron—
Market. Br. & Ann., Nos. 0 to 18.....dis 70&10&75 %
Market. Coppered, Nos. 0 to 18.....dis 70@70&5 %
Market, Galvanized, Nos. 0 to 18.....dis 65&5 %
Market Tin'd. Tinned list Nos. 0 to 18.....dis 67½ %
Stone Br. & Ann'd, Nos. 16 to 18,...dis 72½@72½&5 %
Stone, Bright & Ann'd, Nos. 19 to 26.....dis 75@75&5 %
Stone. Br. & Ann'd, Nos. 27 to 36.....dis 75&10&5
Stone, Tin'd, Tin'd list, Nos. 18 to 36..dis 70@70&10
Tinned Broom Wire, Nos. 18 to 24..dis 70&5@70&10
Galvanized Fence.....dis 65
Annealed Fence, Nos. 8 & 9.....dis 75
Annealed Grape, Nos. 10 to 14.....dis 75 ;
Brass, list, Jan. 18, '84.....dis 15 @ 20 %
Copper, list Jan. 18, 1884.....dis 20 @ 25 %
Barb Fence.....See Trade Report
Wire on Spools.....dis 65 %
Malin's Steel and Tinned Wire on Spools.....dis 40 %
Malin's Brass and Copper Wire on Spools.....dis 30 %
Cast Steel Wire.....dis 50 %
Stubs' Steel Wire.....$6.00 to 2, dis 30 %
Steel Music Wire, Nos. 12 to 30.....55¢ ₩ ℔
Picture Wire.....dis 60&10 %
Barb Wire Safety Guards.....₩ 1000 $9.00, dis 25 %
Wire Clothes Lines. See Lines.

Wire Cloth, Netting, &c.
Painted Screen Cloth, No. 34, ₩ 100 sq. ft.....$1.90
Painted Screen Cloth, No 35, ₩ 100 sq. ft.....$2.09
Galvanized Wire Netting.....dis 70&10 @ 75 %

Wire Goods.—See Bright Wire Goods.

Wire Rope.—List May 1, 1886.....dis 33⅓ %

Wrenches.—American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 40&10 @ 50 %
Baxter's Diagonal.....dis 40&10 @ 50 %
Coes' Genuine.....dis 55&3 %
Coes' "Mechanics'".....dis 55&10&3 %
Girard Standard.....dis 70&10 %
Machinists, Sterling Wrench Co......dis 70&10 %
Lamson & Sessions' Engineers'.....dis 60&10 %
Lamson & Sessions' Standard.....dis 70&10 %
Coes' Pattern, Wrought.....
Girard Agricultural.....
Lamson & Sessions' Agricultural.....
Sterling Wrought.....
} dis 80 @ 80&5 %
Bemis & Call's Patent Combination.....dis 35 %
Bemis & Call's Merrick's Pattern.....dis 35 %
Bemis & Call's Brigg's Pattern.....dis 25 %
Bemis & Call's Cylinder or Gas Pipe.....dis 40&5 %
Bemis & Call's No. 3 Pipe.....dis 35&5 %
Aiken's Pocket (Bright).....$6.00, dis 50&10 %
The Favorite Pocket (Bright).....₩ doz $4.00, dis 40 %
Webster's Patent Combination.....dis 25 %
Boardman's.....dis 20&10 %
Always Ready.....dis 25&5 %
Alligator.....dis 50 %
Donohue's Engineer.....dis 20&10 %
Acme, Bright.....dis 60&3 %
Acme, Nickeled.....dis 50&3 %
Walker's.....dis 55&2
Diamond.....dis 40 %
Diamond Patent Steel.....dis 40 %

Wringers, Clothes.
List Jan. 10 1888, $2.50 off.

Wrought Goods.
Staples Hooks, &c., is Jan. 12, '87.dis 80&20@80&20&2 %

Extra 10@10&5 % generally given.

CURRENT METAL PRICES.

OCTOBER 24, 1888.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:
¾ to 2 in. round and square.. } ₱ lb 1.90 @ 2.00¢
1 to 6 in. x ⅝ to 1 in..... }
Refined Iron:
¾ to 2 in. round and square.. }
1 to 4 in. x ⅝ to 1½ in..... } ₱ lb 2.10 @ 2.2¢
4½ to 6 in. x ⅝ to 1 in..... }
1 to 6 in. x ¼ and 5-16 ..... ₱ lb 2.30 @ 2.4¢
Rods—⅝ and 11-16 round and sq..₱ lb 2.30 @ 2.3¢
Bands—1 to 6 x 3-16 to No. 12.....₱ lb 2.30 @ 2.4¢
"Burden Best" Iron, base price..₱ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price..... ₱ lb 2.80 @ ....¢
"Ulster"..... lb 3.10 @ ....¢
Norway Rods ..... 4.00 @ 5.00¢

Merchant Steel from Store.

Per pound.

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots..... 2¾¢ @ 3¢
Best Cast Steel, base price in small lots 8¾¢ @ 9¼¢
Best Cast Steel Machinery, base price in small lots..... 5½¢ @ 6¢

For Classification and Extras adopted by the Merchant Steel Association of the United States, June 1, 1888, see *The Iron Age*, June 21, 1888.

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16.....	₱ lb 2.75	@ 2.80¢	3.25 @	....¢
17 to 20.....	₱ lb 2.85	@ 3.00¢	3.25 @	3.50 ¢
21 to 24.....	₱ lb 3.00	@ 3.10¢	3.50 @	....¢
25 and 26....₱ lb	3.20	@	3.50 @	....¢
27..... ₱ lb	3.35	@ 3.37½¢	3.75 @	....¢
28..... ₱ lb	3.50	@ .. ..¢	4.00 @	....¢

	B. B.	2d qual.
Galv'd, 14 to 20, ₱ lb,	4.50 @	4.38 @ .....¢
Galv'd, 21 to 24, ₱ lb,	4.87½ @	4.75 @ .....¢
Galv'd, 25 to 26, ₱ lb,	5 25 @	5.12 @ .....¢
Galv'd, 27..... ₱ lb,	5.62½ @	5.48 @ .....¢
Galv'd, 28..... ₱ lb,	6.00 @	5.85 @ .....¢
Patent Planished..... ₱ lb	A 10¢	B, 9¢
Russia..... ₱ lb	9½¢ @ 10¢	
American Cold Rolled B. B..... ₱ lb	5¢ @ 7¢	

English Steel from Store.

Best Cast ..... ₱ lb	15 ¢
Extra Cast ..... ₱ lb	16½ @ 17 ¢
Swaged, Cast..... ₱ lb	16 ¢
Best Double Shear..... ₱ lb	15 ¢
Blister, 1st quality..... ₱ lb	12½¢
German Steel, Best..... ₱ lb	10 ¢
2d quality. ..... ₱ lb	9 ¢
3d quality ..... ₱ lb	8 ¢
Sheet Cast Steel, 1st quality..... ₱ lb	15 ¢
2d quality..... ₱ lb	14 ¢
3d quality..... ₱ lb	12½¢

METALS.

Tin.

	Per ₱
Banca, Pigs.....	25¢
Straits, Pigs.....	25¢
English, Pigs.....	24½¢
Straits in Bars.....	26¢

Tin Plates.

Charcoal Plates.—Bright.

		Per box.
Melyn Grade.....	IC, 10 x 14.....	$6 00 @ $6.25
" "	IC, 12 x 13.....	6.25 @ 6.50
" "	IC, 14 x 20.....	6.00 @ 6.25
" "	IC, 20 x 28.....	12 50 @ 13.00
" "	IX, 10 x 14.....	7.50 @ 7.75
" "	IX, 12 x 12.....	7.75 @ 8.00
" "	IX, 14 x 20.....	7.50 @ 7.75
" "	IX, 20 x 28.....	15 50 @ 16.00
" "	DC, 12½ x 17.....	5.75 @ 6.00
" "	DX, 12½ x 17.....	7.25 @ 7.50
Call and Grade.....	IC, 10 x 14.....	6.00 @ 6 26
" "	IC, 12 x 12.....	6.25 @ 6.50
" "	IC, 14 x 20.....	6.00 @ 6.25
" "	IX, 10 x 14.....	7.50 @ 7.75
" "	IX, 12 x 12.....	7.75 @ 8.00
" "	IX 14 x 20	7.50 @ 7.75
Allaway Grade.....	IC, 10 x 14.....	$5.37½ @ ....
" "	IC, 12 x 12.....	5.50 @ ....
" "	IC, 14 x 20.....	5.37½ @ ....
" "	IC, 20 x 28.....	11.50 @ ....
" "	IX, 10 x 14.....	6.25 @ ....
" "	IX, 12 x 12	6.50 @ ....
" "	IX, 14 x 20	6.25 @ ....
" "	IX, 20 x 28.....	13.00
" "	DC, 12½ x 17.....	.00 @ ....
" "	DX, 12½ x 17.....	6.00 @ ....

Coke Plates—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20.....	$5.00 @	
10 x 20.....	7.50 @	7.65
20 x 28.....	10.25 @	
IX, 10 x 14, 14 x 20.....		5.75
BV Grade.—IC, 10 x 14, 14 x 20.....	4.70 @	

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20.....	$4.62½ @ ....
20 x 28.....	9 25 @ ....
IX, 14 x 20.....	5.62½ @ ....
20 x 28.....	11.37½ @ ....
Abecarne Grade.—IC, 14 x 20.....	4.50 @ ....
20 x 28.....	9.00 @ ....
IX, 14 x 20.....	5.50 @ ....
20 x 28.....	10.80

Tin Boiler Plates.

IXX, 14 x 26.....112 sheets.	$12.50 @ $12.75
IXX, 14 x 28..... 112 sheets....	12 75 @
IXX, 14 x 31.....112 sheets	14.25 @

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₱ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake.....	@ 18½¢
"Anchor" Brand.....	@ 18 ¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
90	72		25	25	25	26	27	28	31	33
90		72	25	25	25	26	28	30	34	....
96	96		25	25	25	27	29	33	36	....
96		96	25	25	26	28	30	34	38	....
48	96		25	25	27	29	31	35	....	....
48		96	25	25	28	30	32	36	....	....
60	96		25	25	30	32	37	....	....	....
60		96	25	26	31	....	....	....	....	....
84	96		26	27	..	....	....	....	....	....
84		96	27	28	....	....	....	....	....	....
Over 84 in. wide			28	30	....	....	....	....	....	....

	16 oz.	14 oz.	12 oz.	10 oz.
All Bath Tub Sheets.....				
Per pound.....	$0.28	0,30	0.32	0 35

Bolt Copper, ½ inch diameter and over, per pound..... 25¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

Per pound.

14 ounce to square foot and heavier.....	28¢
12 ounce and up to 14 ounce to square foot.....	29¢
10 ounce and up to 12 ounce.....	31¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each.....	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each.	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sires, 7 in. (sheets 14 in. x 52 in.) each.....	12¢
Tinning sheets on one side, other sizes, per square foot.....	2½¢
For tinning both sides double the above prices.	

Planished Copper.

Planished Copper List May 5, 1888 ....Net

Brass and Copper Tubes.

Seamless Copper.		Seamless Brass.	
⅜ inch ₱ lb.....	50¢	⅜ inch ₱ lb.....	47¢
½ " "	44¢	½ " "	41¢
⅝ " "	42¢	⅝ " "	39¢
¾ " "	40¢	¾ " "	37¢
⅞ " "	39¢	⅞ " "	36¢
1 " "	37¢	1 " "	34¢
1½ " "	34¢	1½ " "	31¢

Roll and Sheet Brass.

Discount from list. ..... .10 @ 15 %

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₱ 100 lb.

Western Spelter.	5½¢ @ 6¢
" Bergenport "	8¾¢
"Bertha"	7¾ @ 8¢

Zinc.

Duty; Sheet, 2½¢ ₱ lb.

600 lb casks.....	6¾¢
Per lb	7½¢

Lead.

Duty: Pig, $2 ₱ 100 lb. Old Lead, 2¢ ₱ lb. Pipe and Sheets, 3¢ ₱ lb.

American.....	4½ @ 4¾¢
Newark	4½ @ 4¾¢
Bar.....	5¾¢
Pipe, subject to trade discount.....	7½¢
Tin-Lined Pipe, subject to trade discount.....	15¢
Block Tin Pipes, subject to trade discount.....	45¢
Sheet, subject to trade discount.....	8¼¢

Solder.

½ @ ½ (Guaranteed)..... 16¢
Extra Wiping ..... 13½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson.....	₱ lb 13¾ @ 14¢
Hallett s	" 11½¢

Plumbers' Brass Work.

	Discount per cent.
Ground Bibbs and Stops.....	55&10&2
Ground Stops, Hydrant Cocks, &c.....	55&10&2
Corporation Cocks..	55&10&2
Corporation Cocks, "Mueller" Pattern, from Western list.....	55&10&2
Ground Basin and Shampooing Cocks....	50&10&2
Compression Basin Cocks	50&10&2
Compression Basin and Sink Cocks.....	50&10&2
Compression Pantry Cocks.....	50&10&2
Compression Double Basin and Shampooing Cocks	50&10&2
Compression Double Bath Cocks.....	50&10&2
Compression Bibbs, Urinal Cocks, Sill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks.....	50&10&2
Basin Plugs and Basin Grates.....	55&10&2
Bath and Wash Tray Plugs.....	55&10&2
Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets.....	55&10&2
Basin Clamps, Basin Joints and Strainers	55&10&2
Boiler Couplings, Ground Face, per set $1.25.....	dis 10
Boiler Couplings, Plain Face, per set $1.20..	dis 10
Water Back Valve and Plain Couplings, Soldering Nipples and Unions.....	55&10&2
Union Joints.....	60&10&2
Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides.....	55&10&2
Hose Goods	55&10&2

Steam and Gas Fitters' Brass and Iron Work.

	Discount per cent.
Brass Globe Valves.....	60&10&2
Finished Brass Globe Valves, with Finished Brass Wheels.....	40&10&2
Brass Globe Valves, with Patent Wood Wheels.	60&10&2
Brass Globe Angle and Corner Valves.....	60&10&2
Brass Radiator Angle Valves.....	60&10&2
Brass Radiator Angle Valves. Frink's Patent.	60&10&2
Brass Cross and Check Valves.....	60&10&2
Brass Check Valves.....	60&10&2
Brass Hose Valves.....	60&10&2
Brass and Iron Frink Valves	60&10&2
Brass Safety Valves.....	60&10&2
Brass Vacuum Valves.....	50&10&2
Brass Whistle Valves.....	60&10&2
Brass Balance, Back Pressure and Foot Valves.	50&10&2
Brass Butterfly and Throttle Valves.....	50&10&2
Brass Pump Valves.....	50&10&2
Brass Steam Cocks.....	57½&10&2
Brass Service, Meter and Union Meter Cocks..	57½&10&2
Brass Whistles, Water Gauges and Oil Cups..	60&10&2
Brass Hollow Plug, Tallow and Globe Oil Cups.	50&10&2
Brass Lubricators.....	60&10&2
Brass Air Valves.....	60&10&2
Brass Air Cocks.....	60&10&2
Brass Gauge Cocks	55&10&2
Brass Cylinder Cocks and Steam Bibbs..	50&10&2
Brass Swing Joints and Expansion Joints.	50&10&2
Brass Test Pumps.	50&10&2
Brass Steam Fittings, Rough.....	60&10&2
Brass Steam Fittings, Finished..	50&10&2
Brass Union Joints.....	60&10&2
Brass Soldering Unions and Nipples ...	55&10&2
Brass Hose Fittings, Fusible and Boiler Plugs.....	55&10&2
Iron Body Globe, Angle, Cross and Check Valves	65&10&2
Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves.....	65&10&2
Iron Cocks, all Iron	65&10&2
All Iron Valves.....	65&10&2

Miscellaneous.

	Discount per cent.
Cast Iron Fittings.....	70&10
Plugs and Bushings	75&10
Malleable Iron Unions...	67½
Malleable Iron Fittings.....	35

Paints.

Black, Lamp—Coach Painters'.....	₱ lb 22 @ 24¢
" Ordinary.....	6¢
Black, Ivory Drop, fair.....	12 @ 15¢
" " best.....	23¢
Black Paint, in oil.....kegs, 8¢; assorted cans,	11¢
Blue, Prussian, fair to best.....	40 @ 55¢
" " " in oil.....	45 @ 55¢
" Chinese dry	70¢
" Ultramarine.....	18 @ 30¢
Brown, Spanish.....	1¼¢
" Van Dyke.....	10 @ 12¢
Dryers, Patent American..ass'd cans, 9¢; kegs,	7¢
Green, Chrome	15 @ 23¢
Green, Chrome in oil.....	14 @ 18 @ 25¢
Green, Paris.....	good, 20¢; best, 25¢
Green, Paris in oil	good, 30¢; best, 35¢
Iron Paint, Bright Red.....	₱ lb 2¼¢
Iron Paint, Brown	₱ lb 1½¢
Iron Paint, Purple	₱ lb 3¢
Iron Paint, Ground in oil, Bright Red....	₱ lb 6½¢
Iron Paint, Ground in oil, Red	₱ lb 5½¢
Iron Paint, Ground in oil, Brown.....	₱ lb 5½¢
Iron Paint, Ground, Purple.....	₱ lb 6¢
Litharge.....	6½¢
Mineral Paints	.2 @ 4¢
Orange Mineral.....	10¢
Red Lead, American.....	6½¢
Red Venetian (Eng.) dry.....	$1.65 @ $1.70
Red Venetian in oil.....asst'd cans, 11¢; kegs,	8¢
Red Indian Dry.	9 @ 12¢
Rose Pink	.10 @ 13¢